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BONE METAPLASIA IN THE TONSIL.*

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HISTORICAL REVIEW.

The question of bone in the tonsil is of interest, not so much because of its clinical significance, but because the question of its possible origin has aroused widespread discussion, from the time Orth¹ reported the first two cases in 1893. Since then many reports have been issued by many different investigators, the opinion growing that the occurrence is not at all uncommon. In 1895, Deichert,² a pupil of Orth's, elaborated upon one of Orth's cases, described two of his own, and added in a footnote that two more had come to his attention since his article had gone to press. The year following, Sterling³ found three cases, and in 1898 two Englishmen, Walsham⁴ and Wingrave,⁵ each reported two cases. In 1901 Pollak⁶ renewed interest in this subject by publishing his findings of bone in many dif-

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ferent types of glands, including tonsils. From that time until 1905 there was a long series of investigations, especially by German pathologists—Nösske, Ziegler,⁷ and Töpfer⁸ wrote in 1902, Reitman⁹ in 1903, and the next year Carter,¹⁰ Lubarsch,¹¹ Newcomb,¹² and Rückert,¹³ followed by Halkin¹⁴ and Schweitzer¹⁵ in 1905. After that, interest was sporadic. Anselmi¹⁶ reported in 1907, Lorenz and Grosvenor,¹⁷ jointly, in 1908, and White¹⁸ in 1911, Theodore¹⁹ in 1912, Grünwald²⁰ in 1913, and Cary²¹ in 1916.

PATHOLOGY IN GENERAL.

Bone in the tonsil has been met with in the following forms:

1. There may be an extension of bone from the skeleton into the tonsil. In all such cases the surgeon has to cut through bone before the tonsil can be removed. Thus, Deichert reports in one of his cases, which also showed bone and cartilage nodules, the concomitant extension into the tonsil of the left styloid process, which had to be cut at enucleation. In the same case the hyoid bone was somewhat elongated and the right stylohyoid ligament contained a piece of bone two centimeters long. Rückert describes a case where cartilage in the tonsil was traced to its connection with the hyoid bone, Newcomb an extension of the styloid process into the tonsil, and Sterling three cases, in all of which the styloid process was probably responsible. The significance of these cases in the general controversy will be discussed later.

2. Another condition is the ossification of the capsule of the tonsil. Theodore describes a bony plate in the capsule of one of his cases; Lubarsch mentions a hardened capsule, and White reports one case in which the whole capsule is ossified.

3. By far the commonest condition is the finding of minute nodules of bone or cartilage or both in tonsils. They are usually microscopic in size, although in a few instances they are large enough to be seen with the naked eye. In almost every case they are confined to the connective tissue, only rarely encroaching on the lymphoid tissue. Walsham describes one case containing cartilage only, in which the nodules originating in the connective tissue penetrated the lymphoid tissue, almost to the surface epithelium. It is very common to find cartilage and bone in the same tonsil.

In order to determine, if possible, the origin of the bone and cartilage in the tonsils, it is necessary to determine the following points:

1. The relation of the bone and cartilage to the surrounding tissue and the presence or absence of a periosteum or perichondrium.
2. The relation of the cartilage and bone to each other, and whether the cartilage at any time appears to give rise to bone.
3. Whether the growing point of the nodule appears to be in the center or at the periphery. If in the center, it is less likely to have originated from the surrounding connective tissue.
4. Whether the surrounding tissue shows any evidence of inflammation or of other conditions that would be likely to lead to metaplastic changes.

Deichert, Nösske, Pollak, and Rückert have all reported cases where the cartilage or bone distinctly grades into the surrounding tissue. One of Deichert's cases shows the cartilage running into the connective tissue by thin threads. Nösske mentions a close connection between the connective tissue and the cartilage and bone, without giving details. In the same case he describes bone nodules originating partly from cartilage, but chiefly from the connective tissue. Pollak's case contained the bone in scar tissue, and was in intimate relation to it. In Rückert's, some of the nodules of cartilage were surrounded by a well-defined layer of connective tissue, while others graded into the surrounding tissue. Cary describes some of the bony nodules as being imperfectly separated from the surrounding connective tissue.

His cartilage showed a transition to a spindle type of cell, which blended with the connective tissue. Recently a case similar to this one came to our attention.

It was not always easy to determine when a periosteum was present. Rückert reported a case where the bone was retracted from the connective tissue, as if definitely separate from it, but there was no membrane surrounding it. Halkin mentions a case where fibrous connective tissue surrounded the bone in a manner resembling a periosteum, but he would not call it by that name. Theodore actually claimed to have seen

a periosteum. In the case of cartilage nodules, Orth reports the finding of a perichondrium once, while Rückert claims to have seen it in every one of the seventeen cases of cartilage in the forty-eight tonsils of infants he examined. In one of his adult cases some of the nodules were surrounded by connective tissue in a manner similar to Halkin's bone case, while others graded into the connective tissue. Halkin says that in his case the cartilage seemed to act like a foreign body, spreading the connective tissue fibers apart, although no definite perichondrium was formed.

Osteoblasts were not reported with certainty in any case. Rückert thought he saw them in one case, while Halkin believed there were not only osteoblasts, but osteoclasts, with resorption of bone in one of his. Haversian canals, lamellæ, and bone corpuscles were much more common. Rückert suspected bone marrow in one of his cases, while Theodore simply describes open spaces filled with round cells and blood vessels. Cary simply says that some of his bony nodules "contained cells corresponding in morphology and position to osteoblasts and osteoclasts."

Most of the cartilage described was of the embryonic type, containing large cells in active division with but little ground substance and no fibers. Elastic fibers were described by Rückert in the cartilage of three cases, by Lubarsch in one fetus and in an infant.

The manner of ossification, where it could be determined, was a matter of interest. By far the largest number of investigators, when they mention their findings at all, describe ossification from cartilage. Among them are Rückert, Halkin, Theodore, Orth, and Deichert.

Rückert describes the gradation from large cartilage cells to small, bone-like cells. Theodore found every gradation, from pure cartilage to pure bone, in the same tonsil. His staining methods showed the zone of calcification. The youngest cartilage was in the middle, a fact which he interpreted to mean that the impetus for growth did not come from the surrounding connective tissue but from within the nodule. Halkin found in one of his cases evidence of ossification extending from the center, and from what he regarded as peri-

osteum at the periphery. In the former case the young bone at the center was completely surrounded by the cartilage. Because of the presence of both types of ossification, Halkin concludes that the formation of bone is not a metaplastic process. He holds that under his conditions, where cartilage was transformed into bone, one would not be likely also to find a periosteum. Cary found both cartilage surrounding bone and bone surrounding cartilage.

The presence or absence of inflammation in the tonsil is an important point in the controversy, as will be seen later. Pollak, Lubarsch, Rückert, Walsham and Wingrave all worked on tuberculous patients. In some of these there was definite evidence of tuberculosis in the tonsils, whereas in others, although the tonsils showed inflammatory changes, there was no definite evidence of tuberculosis. One of Lubarsch's cases was an infant. Cary's case was from a woman who was a victim of recurrent tonsillitis. The enucleated tonsil gave evidence of inflammation by the presence of leucocytes and plasma cells.

THEORIES AS TO THE ORIGIN OF CARTILAGE AND BONE IN THE TONSIL.

Barring the cases where the hyoid bone and styloid process have been elongated in such a manner as to allow them to extend into the tonsils, two explanations have been advanced as to the origin of bone and cartilage in the tonsil. The first is that through pathologic changes in the tonsil the connective tissue has been so changed that an impetus to development in an abnormal direction is given. The bone and cartilage are, therefore, the result of a metaplastic process. The second is that during embryonic development, cartilage cell rests from the second branchial arch, close to which the tonsils originate, have been included in the "anlage" of the tonsil, and these, after a quiescent period, perhaps of many years, give rise under proper influences to the bone and cartilage nodules.

The embryonic theory was first set forth by Orth and Deichert, later by Walsham, Wingrave, Ribbert, Ziegler, Reitmann, Rückert, Lorenz and Grosvenor, Anselmi and Halkin.

Pollak, Nösske and Schweizer are the chief exponents of the metaplasia theory. All of them found degenerative

changes, chiefly tuberculous, in the tonsils which they studied. The reasons they gave for their belief were the following:

1. The tonsil develops after all, or practically all, of the second branchial arch has been resorbed.

2. The cartilage is always found confined to the connective tissue, never in the lymphoid tissue. Even in Walsham's case, mentioned above, the nodules originated in the connective tissue, and merely penetrated the lymphoid tissue.

3. The nodules were usually found in such large numbers that it seemed improbable that there could have been so many rests of the arch.

4. Cartilage and bone were found only where there was distinct evidence of past or present inflammation.

5. There was a regular connection between the cartilage and bone and the adjacent tissue in their cases.

6. All cases reported up to the time of their studies were found among adults.

EMBRYOLOGY OF THE TONSIL.

In order to understand the first argument, it is necessary to know how the tonsil develops. It originates from the wall of the sinus tonsillaris, situated in the dorsal angle of the second pharyngeal pouch, the evagination of tissue between the second and third branchial arches. In the middle of the third month the sinus wall folds in two. From the outer coat and floor of each recess spring epithelial buds, at first solid, but later hollowing out and growing into the surrounding connective tissue, giving rise to the crypts. The tonsil has assumed its characteristic shape before lymphoid tissue is formed, the exact origin of which is doubtful. Hammar²² maintains that it forms from connective tissue. Just previous to the formation of the lymphoid tissue, there is a marked increase in the amount of connective tissue. (See Figure 1.)

Within each arch lies a shaft of cartilage, those of the first three arches giving rise to various bony structures by ossification. From the second branchial arch arise the stapes, the styloid process of the temporal bone, and the lesser horn of the hyoid bone. Between the styloid and hyoid the cartilage degenerates to form the stylohyoid ligament. The length of

the ligament is inversely in proportion to the length of the two bones which it connects, and which are variable in different individuals, especially the styloid. The greater horn of the hyoid is formed by ossification of the cartilage of the third arch.

The cartilage of the second branchial arch lies in such close proximity to the developing tonsil, that such investigators as Grünwald and Theodore believe it is quite possible for cartilage rests to be included. Indeed, Grünwald makes the statement that in some cases an outgrowth of the cartilage of the second arch actually projects into the tonsil as a support. Considering the fact that the connective tissue of the tonsil is fairly complete before the lymphoid tissue begins to develop, the exponents of the cell rest theory maintain that rests of cartilage are likely to be confined to the connective tissue. Instances are on record where rests of the first visceral arch have developed into supernumerary ears.

As for the multiplicity of nodules, Reitmann records the finding of isolated cartilage cells in the tonsil of a sixteen-year-old girl, while Reitmann and Rückert found as many as three cartilage nodules in the tonsils of the newborn.

And this answers another objection, namely, that the findings have all been in the case of adults, whose tonsils gave evidence of past or present inflammation. In 1904 Rückert investigated twenty-four pairs of tonsils from infants varying in age from eight months of fetal life (miscarriages) to one year. Out of the forty-eight tonsils, seventeen showed the presence of cartilage, within the connective tissue of the capsule, near the mucous glands. In only one case was there any evidence of cartilage to the naked eye. In each of two cases two nodules were found. The cartilage was embryonic in character, rich in cells, and poor in ground substance. Often there were two cells in a space, indicating rapid growth. In every case there was a definite perichondrium.

The same year Lubarsch examined twenty-three tonsils from twelve cases ranging in age from fetuses of six months to nurslings of seven and one-half months. In a fetus of eight months he found a cartilage nodule containing fairly large cells and elastic fibers, and surrounded by connective tissue.

Reitmann also found cartilage in a fifty-one millimeter embryo, and in several very young children, in whom the tonsils were otherwise unchanged, as did Anselmi, whose description of his cases we have been unable to obtain.

One of the strongest arguments of those holding the metaplasia theory is the fact that most cases show evidence of past or present inflammation. Walsham, Wingrave, Lubarsch (fifty-nine out of sixty-five cases, including one two-and-one-half-month-old infant), Rückert Reichert, Nösske, Halkin, Theodore, and Cary all worked with cases of that kind. But the opponents of the theory point to the fact that in case of the fetuses and newborn there has been little opportunity for inflammation, and that some of the tonsils of adults show no evidence of inflammation whatsoever.

As for the fact that the phenomenon frequently appears late in life, the adherents of the embryonic theory point to the fact that embryonic cells often lie dormant until late in life, as for instance, the germinal cells.

The histologic findings, such as the relationship between bone and cartilage and the surrounding connective tissue, and of the bone and cartilage to each other, have already been discussed. Those who hold the process to be metaplastic, regard the frequency with which the nodules are in intimate contact with the connective tissue as evidence that they originated from it. Those who hold the embryonic theory ignore that fact, but point out carefully the instances in which there is a real or apparent capsule surrounding the bone nodules, in which ossification seems to have nothing to do with the surrounding tissue.

Zeigler, Lubarsch, Nösske and Cary all regard either theory alone as insufficient. Neither covers all the cases, and in some it is probable that both factors were at work at once. That is, the embryonal rests may lie dormant until abnormal conditions in the tonsils rouse them to activity.

The conditions where the hyoid or other bones become sufficiently elongated to encroach upon the tonsil come outside the pale of this discussion. They form a class by themselves. But Deichert and others hold that, as they originate from the second branchial arch, they indicate an abnormal activity of the arch.

REPORT OF OUR CASE.

The specimen was sent by Dr. F. W. Bailey of Cedar Rapids to Dr. L. W. Dean, by whom it was referred to us.

Clinical History.—Male, age fifty years, physician. Has had most of the common diseases of childhood. Since childhood has had several acute attacks of tonsillitis every year until a few years ago, and mild attacks in recent years. During childhood the tonsils were enlarged, but at the time of enucleation they were so shrunken that they were scarcely visible in the throat. General health good, except for arthritis deformans, as evidenced by pain, stiffness, slight redness, the presence of Heberden's nodes on the knuckles of both hands, which started eight weeks before the tonsillectomy was performed. Has never had rheumatism. The throat was granular. The patient is not a user of alcohol, and drinks tea and coffee moderately.

The tonsils were found to be firmly fixed in the fossæ, and removed with difficulty. No bone tissue was cut at the time of operation. There was considerable hemorrhage, which was, however, readily controlled by the use of hemostats. Recovery was uneventful. The presence of bone was suspected after palpation of the enucleated tonsils.

Gross Pathology.—Both tonsils are about the same size. After being in formaldehyd fixing solution for several weeks, each measured twenty-three millimeters in length, and nine millimeters from surface to base. In width, one was sixteen millimeters and the other eighteen millimeters. Both were removed with the fibrous connective tissue capsules intact. The surface of one is fairly smooth, that of the other somewhat irregular, due to the opening of rather deep crypts. Both tonsils are fairly firm, and each contains a substance near its base of bony hardness and rigidity. Nowhere could bony or other calcareous material be felt on the surface. Bone was reached only on cutting the tonsil and was easily cut through by the knife. The lymphoid tissue of both tonsils was of a normal light grayish color. In each, extending beneath the capsule, was a thin plate of bone, light colored, and easily felt by means of forceps. In one, in which it extends for sixteen millimeters in the capsule at the base, it projects as a thin

plate toward the surface for a distance of six millimeters. In thickness it varies from one-half to two millimeters. (See Figure 3.) At the ends of the projections is light colored tissue, of cartilaginous consistency, and devoid of calcareous matter. In the other tonsil the plate measures eleven millimeters in length and one millimeter in thickness. As far as could be determined by palpation, the plates extend laterally across the base of each tonsil for a distance of eight millimeters. In each case the cut surface of the tonsil shows the calcareous material to be in the form of one large piece and several small islands, but we believe the apparent islands are irregular projections of the main mass.

Microscopic Pathology.—A section through a decalcified piece of one of the tonsils shows the presence of seven pieces of bone. (See Figure 4.) The larger pieces are elongated in the form of plates corresponding to the calcareous plates described in the gross specimen. The bony material contains several large openings, some of which are lined by endothelial cells, and contain red blood corpuscles and a substance resembling fat in appearance. The bone formation appears in the form of concentric whorls arranged about the larger openings. In the bony tissue proper are a large number of small spaces containing cells, with canaliculi radiating from them. The whole appearance presents the arrangement of the Haversian system of true bone. There is a sharp line of demarcation between the bone and the surrounding connective tissue. A section was made through a portion of the tonsil containing a small, firm nodule, presenting the appearance of cartilage and offering the same kind of resistance to the knife. It was not decalcified, yet it was easily sectioned by the microtome knife. It contains concentric lamellæ, bone-like cells, and canaliculi, but no trace of cartilage. The intercellular substance is rather homogeneous, with a small amount of granular calcareous deposit. It is well differentiated from the surrounding tissue. Around it, however, one can see a gradual transition from connective tissue cells to rather large, round cells, with a large amount of cytoplasm, suggesting osteoblasts. The connective tissue here is distinctly increased in amount, invading the lymphoid tissue in some places, and appearing as a broad,

dense band in others. Where the increase in connective tissue is most marked, there is a large amount of adipose tissue and some areas of hyaline degeneration. The lymphocytes are closely crowded, indicating a hyperplasia. The blood vessels have thickened walls and little blood. There are several small, old hemorrhages, characterized by the presence of broken-down red blood corpuscles and hematogenous pigment. The germinal centers are poorly defined.

We also made one section of lymphoid tissue furthest away from the bone. The germinal centers here are well defined, many cells showing mitotic figures, as under normal conditions. The blood vessels are rather distended, especially the capillaries. The connective tissue appears normal. The surface is covered with a rather thin layer of squamous epithelium.

DEDUCTIONS FROM OUR CASE.

When we analyze our case, we are forced to conclude that it is the result of bone metaplasia, rather than of the displacement of cell rests from the cartilage of a branchial arch, and this in spite of the fact that some of the conditions are similar to those which supplied others with arguments for the cell rest theory.

1. From the clinical history we learn that the patient was a sufferer of tonsillitis almost all his life. Microscopically, we find an increase of connective tissue in the neighborhood of the bone.

2. The shape of the bone, which is that of a long thin plate, with extensions into the connective tissue septæ, suggests a definite activity on the part of the connective tissue involved, rather than a development from a cell rest, which would have been more likely to take the form of a fairly regular growth, tending to be spherical in shape.

3. There is no evidence of cartilage. On the contrary, we find a portion of the bone so soft that it could be cut by the microtome knife without decalcification, yet having the appearance of true bone. This indicates that the young bone was not preceded by cartilage. A similar formation was reported by Harvey²³ in a case of experimentally induced bone formation

in an artery of a dog, a case which was one of undoubted metaplasia.

The exponents of the branchial arch theory take the presence of a periosteum to indicate cell rests as the origin of the bone. But our periosteum is in intimate connection with the surrounding connective tissue. Is it not possible that metaplasia here took the form of transforming connective tissue into periosteum, and that the latter gave rise to membrane bone? Normal periosteum is formed by a differentiation of connective tissue cells into osteoblasts.

It seems to us that the argument that the connective tissue of the tonsil develops previous to the lymphoid tissue does not imply that rests from the second branchial arch would necessarily be confined to the connective tissue. No less an authority than Hammar²¹ maintains that the lymphoid tissue probably forms from the connective tissue cells. If that is the case, it is quite possible that the lymphoid tissue would, at least in some instances, include some of the cartilage cells so common in the connective tissue. But such case has never yet been reported. The limitation of cartilage and bone to the connective tissue only, therefore, probably indicates an activity peculiar to that tissue.

We do not mean to imply that all cases are the result of metaplasia, but we do maintain that the evidence held by many of the investigators as practically conclusive proof of the cell rest origin of bone and cartilage in the tonsil is not at all above criticism.

SUMMARY AND CONCLUSIONS.

1. The first report of a case of bone and cartilage in the tonsil was made by Orth in 1893. Since that time several hundred cases have been reported.

2. Bone and cartilage in the tonsil have been found in the following forms:

a. The elongation of the hyoid bone or styloid process of the temporal bone in such a manner as to extend into the tonsil.

b. Bony plates or nodules and cartilaginous nodules.

3. Interest in the phenomenon centers chiefly around the problem of the origin of those bony and cartilaginous masses

in the tonsils, not connected with the skeleton. Investigators have taken sides on two points of view.

- a. One group holds that they are a result of metaplasia following inflammation in the tonsil.
 - b. The other group maintains they are the result of cartilage cell rests from the second branchial arch just below which the tonsil has its origin.
4. It seems evident that a large number of instances can best be explained by the cell rest theory.
 5. Our case, however, seems to fall into the class of bone metaplasia, in spite of the fact that it contains some features which have been used as arguments for the cell rest theory.

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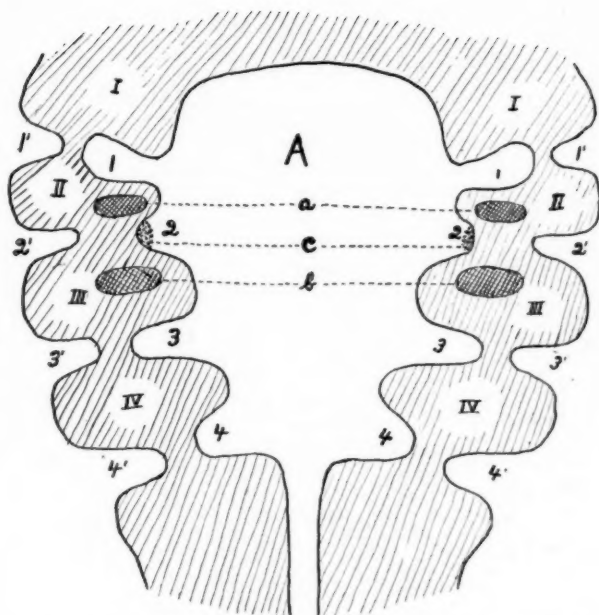
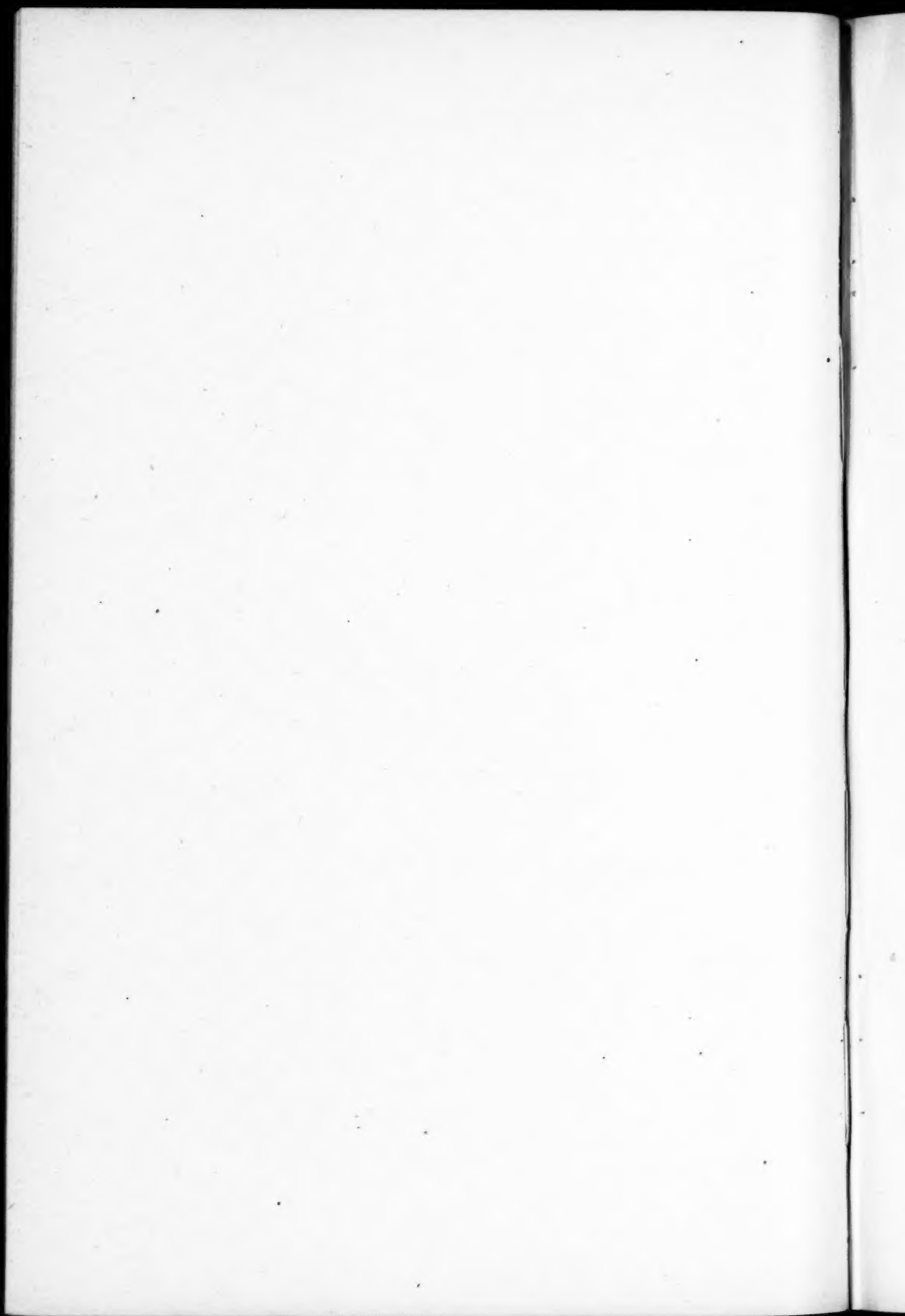


Figure 1.—Diagram showing the origin of the tonsil and its relationship to the adjacent embryonic structures.

- I, II, III, IV.—The four branchial arches respectively.
 1, 2, 3, 4.—The four pharyngeal pouches respectively.
 1', 2', 3', 4'.—The four branchial clefts respectively.
 A, pharynx; a, cartilage bar in second branchial arch;
 b., cartilage bar in third branchial arch; c, developing tonsil.

Note especially the proximity of the developing tonsil to the cartilage bar of the second branchial arch. Rests of cartilage may be misplaced from the latter into the tonsil. From this cartilage is formed, the styloid process of the temporal bone, the lesser cornua of the hyoid bone and the stylohyoid ligament connecting these two bony processes.



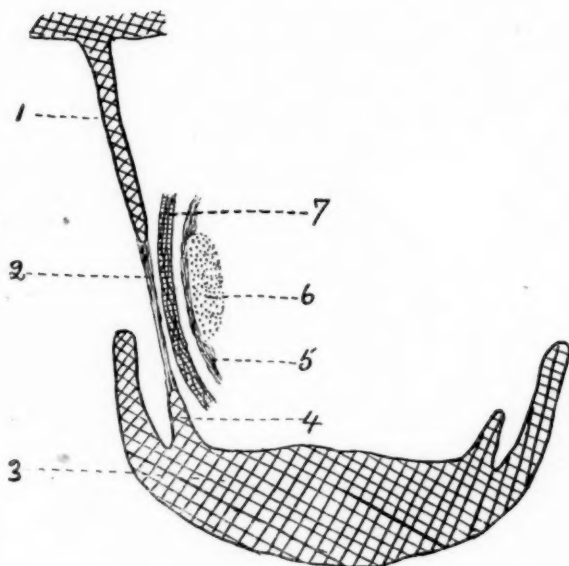
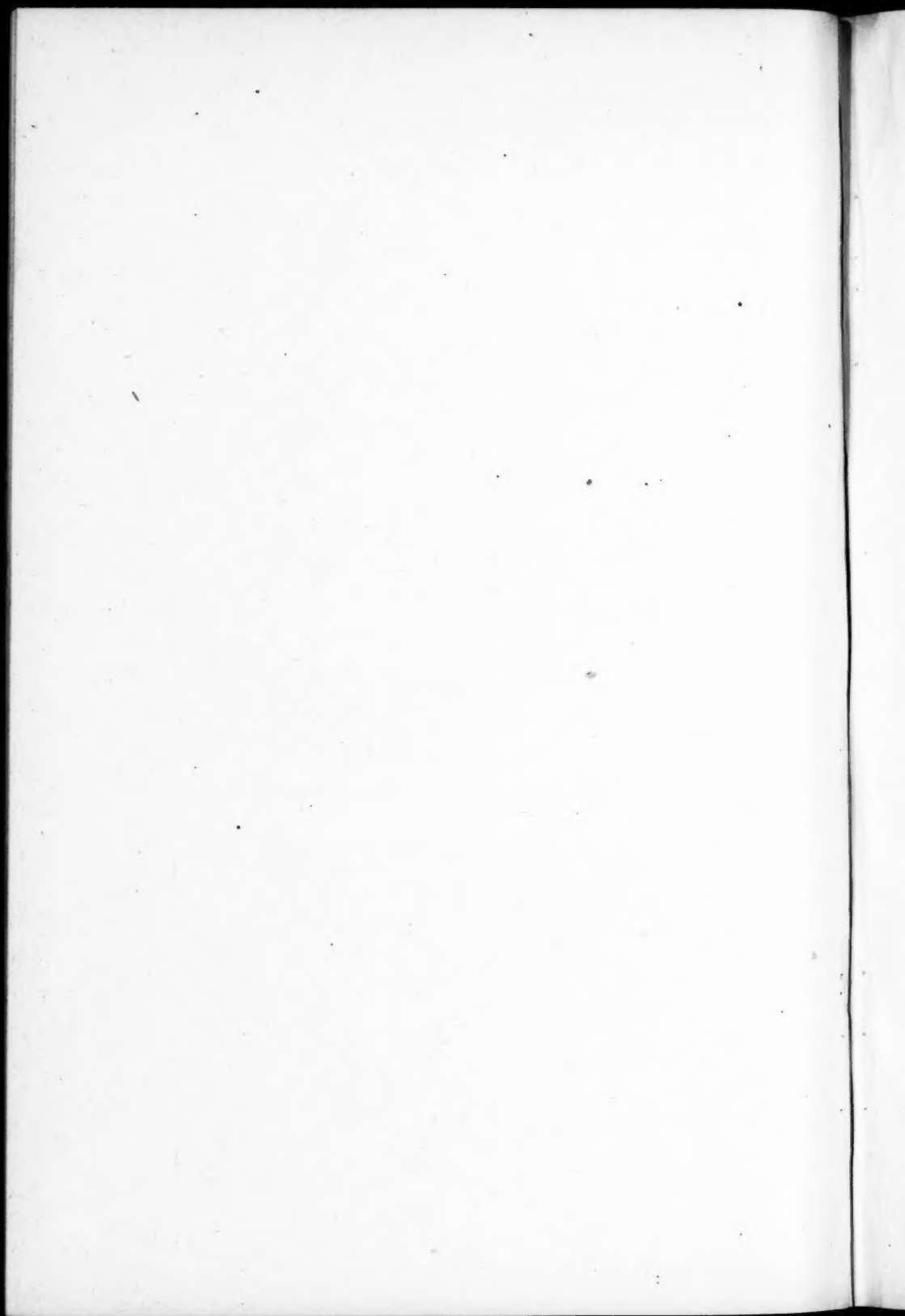


Figure 2.—Diagram showing the relation of the tonsil to surrounding tissue—more especially to the bony processes noted.

1, Styloid process of the temporal bone; 2, stylohyoid ligament; 3, hyoid bone; 4, lesser cornua of the hyoid bone; 5, capsule of the tonsil; 6, tonsil; 7, constrictor muscle of the pharynx.

There are reports of several cases in which either the styloid process of the temporal bone or the lesser cornua of the hyoid bone projected into the tonsil. Such represents one of the three explanations for the presence of bone in the tonsil.



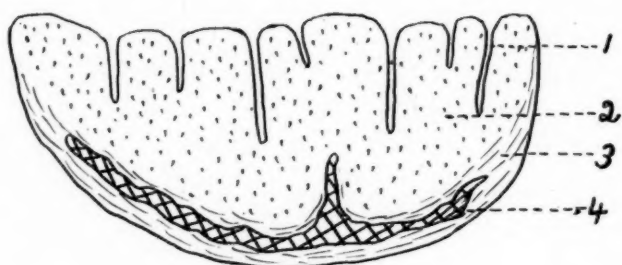


FIGURE 3.

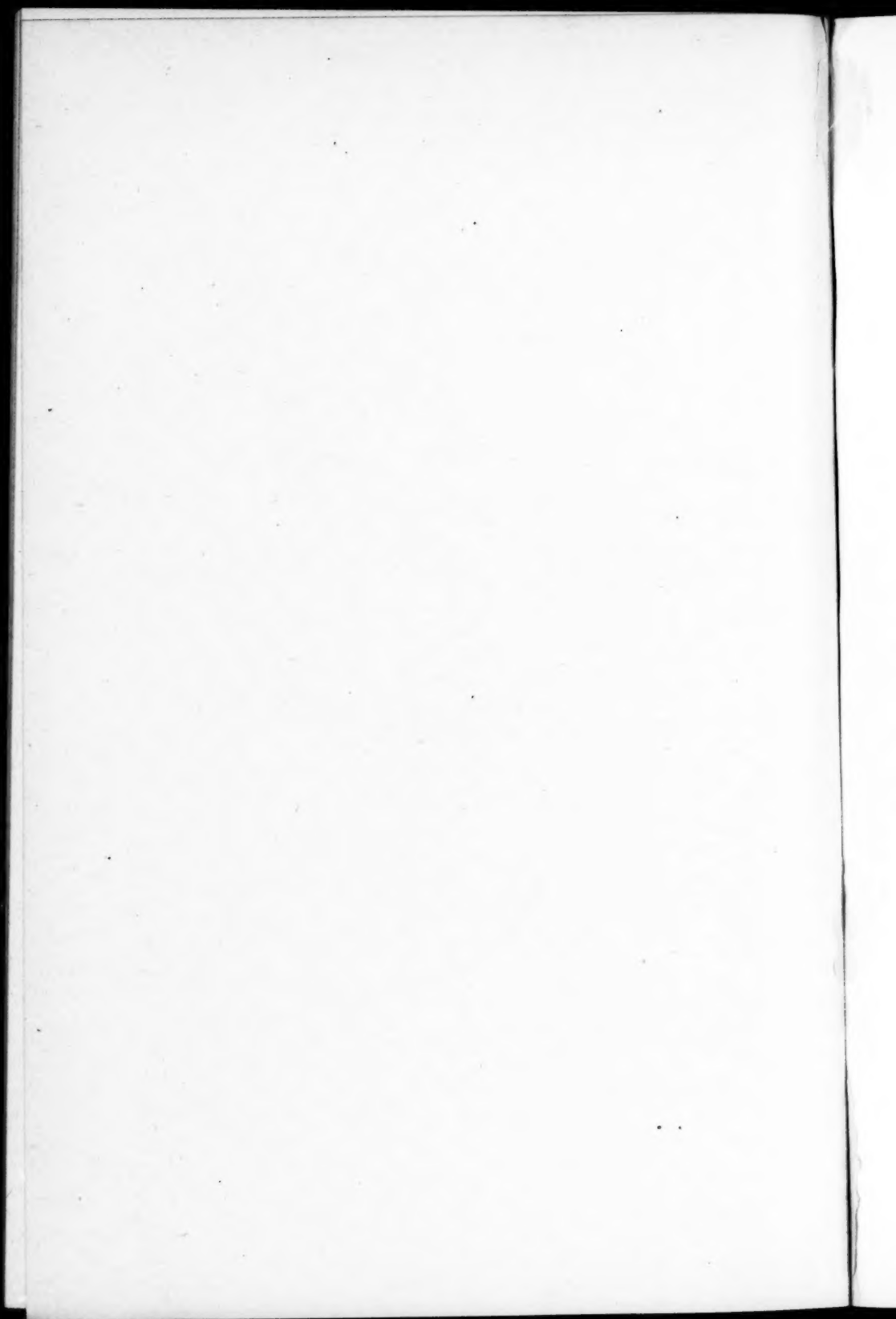




FIGURE 4.

Section through tonsil. Decalcified. Stained with hematoxylin and eosin. Low power. Shows the presence of bone (seven areas) in the capsule of the tonsil. Note that the bone areas are well defined from the surrounding tissue. The lamellæ, bone cells and large central spaces containing fat cells are distinctly noticeable.

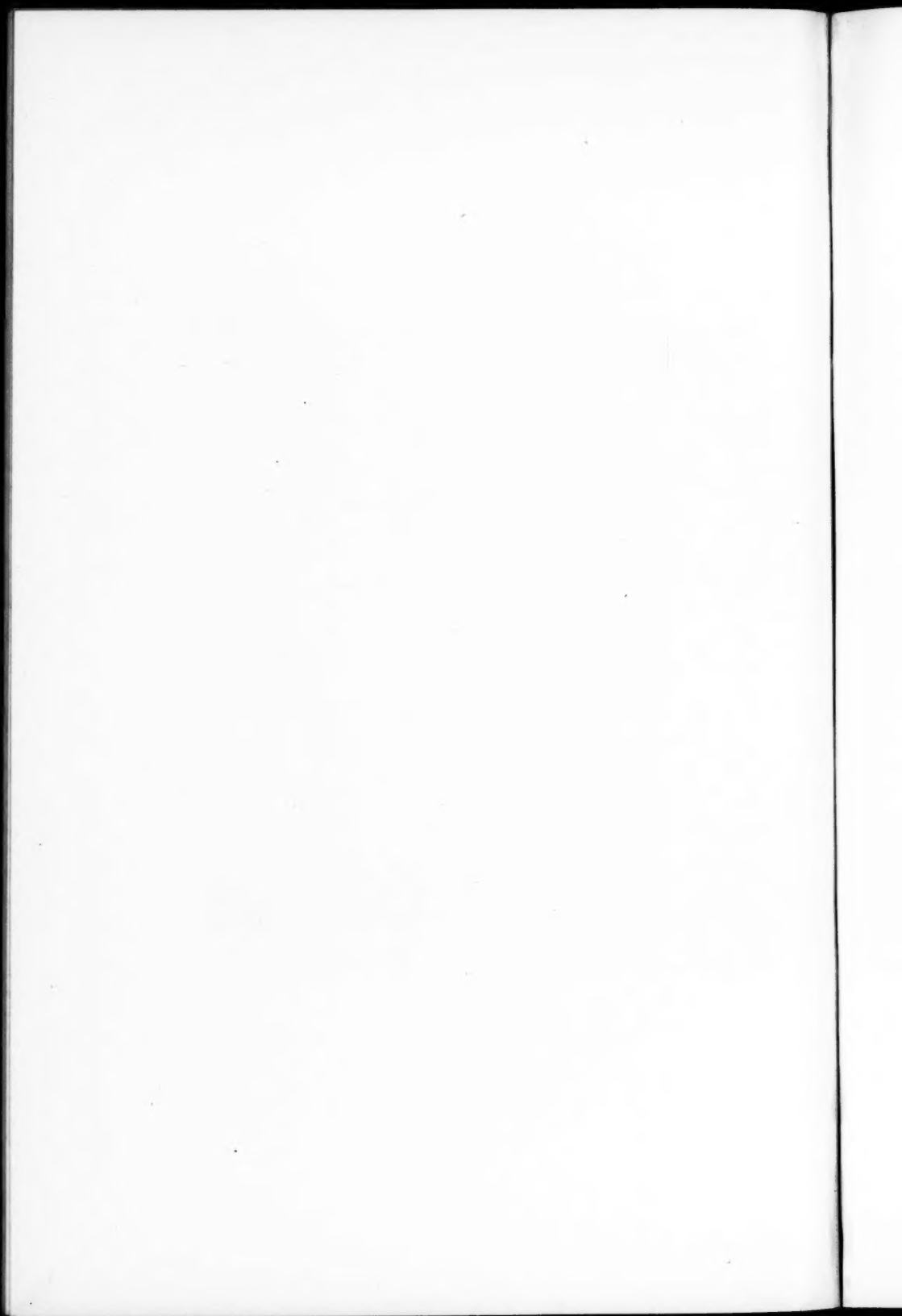
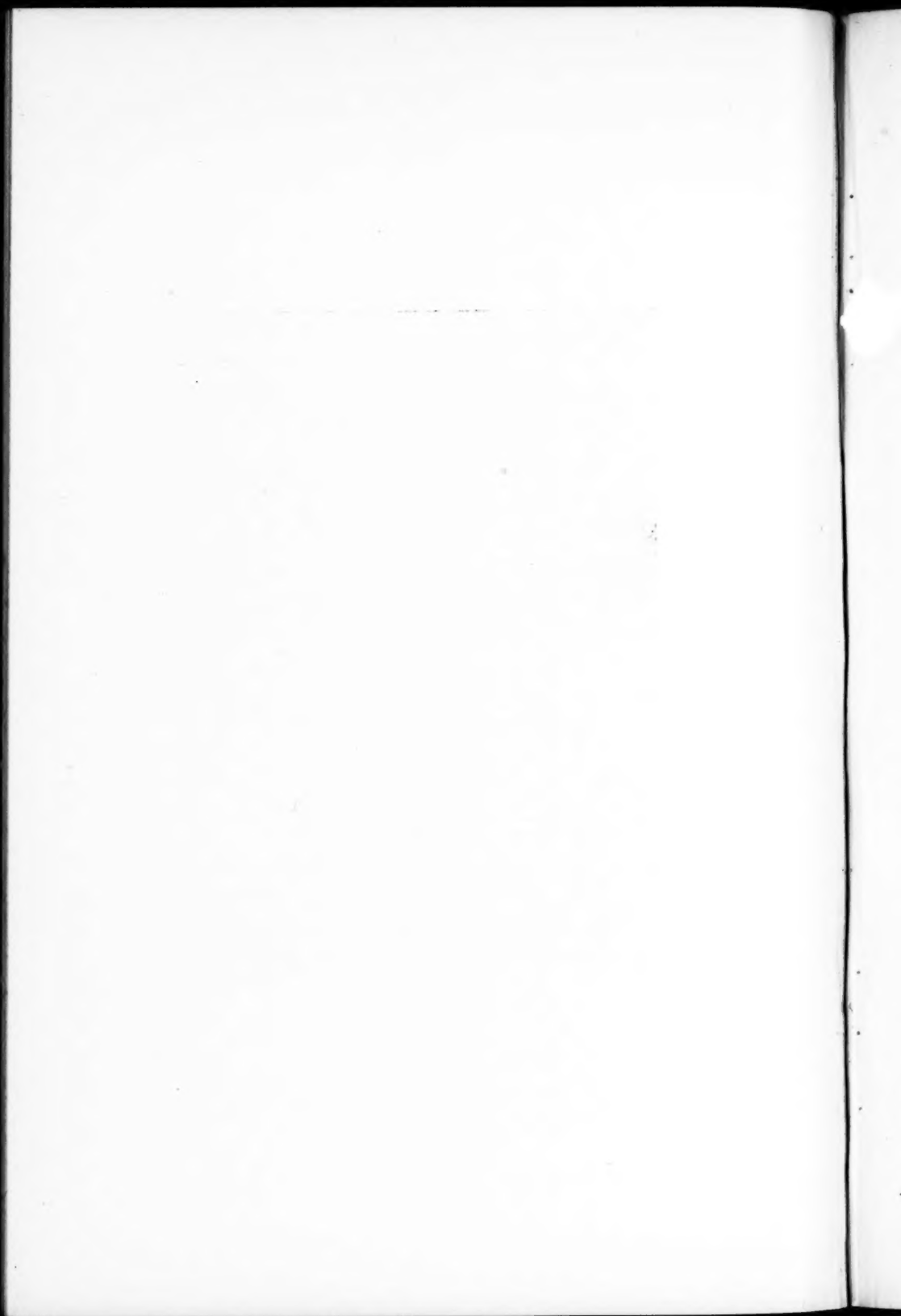




FIGURE 5.

Section through area of bony nodule in tonsil which contained but little calcareous material. Cut without decalcification. Stained with hematoxylin and eosin. High power. Note the central cavity which contains fat cells; the lacunæ with the enclosed bone cells, and canaliculi radiating out from them; also the layer of rather large cells at the periphery of the bony area which probably represents a periosteum.



DOUBLE OTITIS MEDIA.—SUBMILIARY PUL-
MONARY TUBERCULOSIS.*

By EMIL AMBERG, M. D.,

MICHIGAN.

Miss E. W. R., nineteen years old, consulted me December 19, 1916, on account of difficulty in hearing in her right ear which interfered with her work as bookkeeper. The patient, an anemic girl, was very anxious not to miss any work, and not to lose much time. She said she had been hard of hearing in her left ear for four months, and that recently she became hard of hearing in her right ear. The right ear became much worse on the day before yesterday. The right drum membrane was injected, and when the right ear was syringed the fluid went into the throat.

On the left side there was a chronic middle ear suppuration lasting for several months. If I remember correctly, the discharge was offensive and very scanty. Patient has been hoarse for a long time.

On the next day when patient came again, I heard a slight hacking cough. The temperature by mouth was 101.2. The general appearance of the patient did not correspond to the picture of an otitis media and its complications. I therefore, asked the patient to have her chest rayed.

Report on roentgenographic examination, December 20, 1916 (see Figure No. 1).

"(Drs. Hickey and Evans.) Stereoscopic plates were made of the chest. We would report that there is a very definite fine infiltration scattered quite universally through both the right and left lung. This assumes the form of very small snowflake-like deposits. This we think, should be classed as a diffuse, submiliary tuberculosis."

(Signed) W. A. EVANS.

*Read before the American Otological Association, May, 1917.

I advised the patient's mother to have the girl enter Harper Hospital, which she did December 22nd.

From the Harper Hospital records, the following may be mentioned:

December 28, 1916. Wassermann negative.

December 29, 1916. Report of roentgenologist. (See Figures 2 and 3.) "Plates were made of the right and left mastoid. The right mastoid shows rather a large, crisp, pneumatic mastoid, some of the cells of which are quite large and fairly well spaced. The left mastoid does not appear nearly as crisped; the outlines are indistinct. We would think that there was an exudate constituting probably a first degree mastoid."

(Signed) WM. A. EVANS.

December 22nd, 1:15 p. m. Temperature, 99; pulse, 96; respiration, 20. Patient complained of sharp pain in head; ice bag applied to head. Examination of chest and back made by Dr. Wehenkel. 7:30 p. m. Sodium salicylate, gr. V; phenacetine, gr. II; codein sulphat, gr. $\frac{1}{4}$. 9 p. m., feeling much better; headache much relieved. Unable to obtain specimen of sputum.

December 23rd, 8 a. m., incision of right drum membrane. 2 p. m., complained of severe pain in head. Medication ordered by Dr. Wehenkel, containing sodium salicylate, phenacetine, codein phosphate, camphor monobromid. Similar medication was given on subsequent days until about December 31st, when sodium salicylate and phenacetine were discontinued. Aspirin, grains V, was given January 3, 1917, once; January 4th, twice; January 5th, once. These medications, among others, are mentioned only because the temperature and pulse may have been influenced to some extent by the same.

The nights, up to January 4th, were as a rule comfortable; from January 4th to 5th, the patient slept very little; from January 6th to 7th, patient was very restless; whereas from January 7th to 8th, patient had a very good night, but not from January 8th to 9th.

January 5th, patient unable to walk, left hand twitching. At 8 a. m., pulse weak and irregular; at 12 noon, patient cyanosed, respiration heavy. January 8th, 7:40 p. m., respira-

tion shallow; at 8 p. m., patient was unconscious, and passed away at 9:10 p. m.

Dr. A. M. Wehenkel, who occupies himself particularly with tuberculosis, kindly examined the patient, prescribed for her and reports as follows:

Family History.—I did not learn anything about her family.

Past History.—Three years ago she had an attack of coughing—began to lose weight—had lost considerable weight in a short time; had frequent attacks of cold. It was then called "bronchitis," the cough persisting. Had several attacks of pleurisy during past three years. She temporarily recovered until last fall when took "fresh cold," the cough was renewed; she began to lose weight, P. M. fatigue set in, pain in right side aggravated by long breaths, blood tinged sputum occasionally; night sweats; fever in evenings, an incessant cough set in. Some nights she would cough all night without any sleep.

Meningeal Symptoms.—She developed a headache which was gradual in onset, and progressive in severity; she vomited occasionally, not associated with nausea; she was constipated constantly. After four or five days her eyes became somewhat fixed—double vision. She began to have pain in her spine with a little stiffness in her neck. When I saw her last there was no Kernig's sign; temperature rise in evening.

Physical Findings.—Larynx, mouth and nose were negative; the expansion of chest was diminished on both sides, but more lagging on the right side; no depressions. On palpation the right side showed an increased fremitus, extending over the upper two lobes, quite marked posteriorly between 4th and 6th interspaces. On percussion both apices were retracted, more marked on right; percussion note dull over middle lobe posteriorly; the resonant area was quite high on right side posteriorly.

Auscultation.—Breath sounds over right apex were diminished with high pitch and prolonged expiration to fourth rib anteriorly; posteriorly to about seventh. Harsh respiration over upper left lobe, scattered crackling rales over entire right base of lung; vocal fremitus much increased over middle lobe posteriorly; fine rales were present over left apex. In con-

clusion, I would say that she had a bilateral infection. The condition was a fibroid tuberculosis involving both sides for some time quiescent, and which had become very active; undoubtedly taking on a miliary form with an extension to the meninges. Owing to the very high temperature, it is possible that she had an accompanying secondary infection.

Additional Remarks.—While writing the paper, I learned from a friend of hers that about two weeks before going to the hospital friends met the patient at a party where she complained of pain in her ear (which?), and that a physician told her that she needed rest more than anything else, that other friends commented on her white complexion, with a bright red spot on each cheek. The same friend visited her in the hospital two or three days before she died. She looked a long time at the friend and said: "Why, is that Rena? I can hardly see you."

The mother says that the patient always complained of headache, and that she had irregular menses. In May started with a severe headache; she never complained to have earache, always headache, except when she was in the hospital when the right drum membrane was incised.

The mother says that during the last week the patient saw double with and without her spectacles. An aunt was sitting on a chair and the patient thought the aunt was sitting on the floor. Patient could not see well without glasses, but she did not have double vision before she entered the hospital.

A few days before patient came to me, she said: "After Christmas I am going to take an inventory of myself. I have not got a well spot on me, I ache all over." She thought the office would not get along if she were not there. Twice she was brought home after having fainted; once after leaving the street car, once in the office. The mother also reports that the daughter never told her anything about the left ear for fear she would send her to a physician, but the mother learned from a friend of her daughter, that the patient complained for a long time, now and then, of quite severe pain in the left ear, but that the ear did not discharge. The patient had also complained that the whole left side of the body felt numb.

SUMMARY.

The patient consulted me on account of a disturbance in her right ear, which interfered with her work. The patient was entirely unaware of the seriousness of her general condition, even to the end. (Her employer told me that he had warned the patient for some time to take care of herself.) The finding in her lungs at once reversed the whole viewpoint on account of the bad prognosis. On account of the miserable condition of the patient some of the routine examinations, which would have been made, were not made. The lumbar puncture might have been the most important one from a diagnostic standpoint.

The symptoms on the part of the brain and its coverings were characteristic for meningitis. A gradually developing cloudiness of the mind, more or less severe remitting headache, constipation; on December 29th, tenderness on pressure, not so much over left mastoid as in surrounding tissue (probably part of a general hyperesthesia); January 4th, creeping pain in neck (relieved by hot water bag); January 2nd, a complaint that she can see, but cannot make out anything.

It must be considered what importance must be attributed to the disturbance in the left tympanic cavity and mastoid process; also, whether the meningitis resulted therefrom, or, whether the tubercular trouble was aggravated by the presence of this focus; or, whether there existed no relation between the two conditions.

Concerning a possible exploratory operation on the left mastoid (see also X-ray report), there may perhaps be a difference of opinion. Dr. D. P. Mayhew, in a paper before the Wayne County Medical Society, Detroit, May 14, 1917, reported a number of operations, including mastoid operations, which have successfully been performed in Colorado on patients suffering from tuberculosis. Whether such a grave general condition as that found in our patient would have permitted an operation on the left side, even if the same had been much more clearly indicated, is very doubtful, especially at this stage of the general disease.

An autopsy was not performed.

TUBERCULAR MASTOIDITIS—RADICAL OPERATION UNDER COCAIN ANESTHESIA.*

BY HAROLD HAYS, M. D.,

NEW YORK.

About two years ago, Mr. S., aged twenty-four years, came to consult me about his deafness and sharp pain in the right ear. His history showed that he had had a tuberculosis of the lungs which at that time was in a quiescent state. He had had a radical mastoid operation performed on the left ear and mastoid four years before. This had never healed properly, with the result that there was a large opening into the dura which was constantly suppurating.

Examination of the right ear showed granulations in the middle ear, entire destruction of drum, and the discharge of cheesy-like pus. Culture from this ear and from the sinus behind the left ear showed numerous tubercle bacilli. He could hear neither watch nor tuning fork at either ear.

During that first winter I had him under observation two or three times a week, during which time I attempted every known means of clearing up the condition.

As he did not improve, I advised a radical mastoid operation.

The question of anesthesia was an important one. Here was a patient with a quiescent tuberculous process in his lungs, a patient whose general physical condition was far below par. Ether anesthesia per oram would possibly light up his lung condition, so I determined to operate upon him under local anesthesia.

On the day of the operation at ten o'clock in the morning he was given a hypodermic injection of morphin grain one-fourth, atropin grain one-one-hundredth. Two hours later a

*Read before the New York Academy of Medicine, Section on Otol-ogy, October 13, 1916.

second injection of like amount was given. At two o'clock he was brought to the operating room. As there were no signs of opium poisoning, another injection of morphin grain one-eighth was given. The operative field was prepared in the usual manner. A solution of equal parts of ten per cent cocain with equal parts of adrenalin having been prepared, an injection of this solution along the line of the proposed incision was made, going well into the surrounding tissues, forward to the lobe of the ear, upward to the zygoma, and backward to the occipital bone. An attempt was made to have the injections reach down to the periosteum. This is not a difficult matter in this region, as the tissues are not very thick.

The semilunar incision was made throughout its whole extent down to the periosteum. A longer needle was attached to the hypodermic syringe and an injection made under the periosteum of a one-half of one per cent cocain solution with equal parts of adrenalin (Shleich infiltration). Two to three drams of this solution were injected, care being taken that some of it reached the periosteum below the tip and anterior to the bony canal. It was spread through the tissues posteriorly and above until an area of at least three to four square inches was infiltrated.

The periosteum was then incised and scraped back with a rasp and the retractors were inserted.

After the bone was well exposed the mastoid cavity was uncapped with a chisel. The patient complained of no pain at any time while I was working in the mastoid cavity. The operation was a Schwartz-Stacke. The cavity was extremely large, the bone extremely hard, the tip entirely destroyed so that it had to be removed in its entirety. When the patient was asked to describe his sensations, he stated that he felt no pain, only the apprehension of pain, similar to what he would feel in the dentist's chair. We are wont to feel that in the mastoid operation under ether anesthesia, the constant chiseling and using of rongeurs produces a slight concussion of the brain, which accounts for the lessened amount of ether we have to give. After this experience I am inclined to think that this idea of ours is visionary. The constant pounding of the bone produced no marked change in the patient's mastoid condition. In fact, he did not seem to mind it at all.

The mastoid cavity was thoroughly cleaned out without any trouble. The bony canal wall and the bridge over the antrum were taken down without any pain. However, when the sensitive mucous membrane of the middle ear was reached, trouble commenced. It had been impossible thus far to cocaineize this membrane. Here was a mass of sensitive granulation tissue. In order to overcome this sensitiveness a four per cent cocaine solution was injected along the posterior canal wall, into the granulations themselves and deep down into the eustachian tube. Not all sensitiveness could be overcome, but enough to proceed with the operation with little trouble. The mass of granulations were removed with a curette until I came to a thicker tougher mass, apparently attached to the internal wall of the middle ear. I hesitated to remove this, as I realized that the facial nerve was either in it or close by. But the mass was infected and had to be removed. I grasped it with forceps and snipped it off with a small scissors. At once the patient exclaimed: "Doctor, you must have hit my facial nerve. The right side of my face is paralyzed." Such was the fact.

The eustachian tube was curetted and a skin flap for a new canal made without any trouble. The making of the skin flap was facilitated by the lack of bleeding, due to the blocking off of the vessels by the cocaine solution. When one realizes how much bleeding there usually is, he can appreciate of how much value this ischemia was. After making the artificial canal the posterior wound was closed with tendon sutures.

Three hours after the operation the patient sat up in bed to eat his supper. Having had a radical mastoid operation performed on the other side under ether anesthesia, he was in a position to make comparisons. He was most enthusiastically in favor of local anesthesia. Not only had the general reaction been severe at the time of the former operation, but his wound pained him a great deal. In this instance the pain was practically nil. At the end of the week he left the hospital with his wound in excellent condition. The facial paralysis began to improve, so apparently the nerve was not completely severed.

A few months ago I lost track of the patient. I had hoped to present him at this meeting. But I received a letter a short time ago stating that he had died at Bellevue Hospital during

the summer from a tubercular meningitis. Autopsy showed a direct extension of tuberculosis from the suppurating cavity behind the left ear to the dura.

The practical points to be deduced from this case are the following:

1. That the radical mastoid operation can be done under local anesthesia without any pain.

2. That the superficial scalp tissues and periosteum are sensitive, but that bone has absolutely no sensation.

3. That the mucosa of the middle ear is extremely sensitive and must be separately cocainized.

4. That irritation or destruction of the facial nerve is immediately noticeable to the patient.

5. That the after-effects are practically nil.

6. That the end result is just as good under local as general anesthesia.

LVII.

OZENA AND ASPHYXIATING GAS—A NEW
ETIOLOGIC STANDPOINT.*

BY MARCEL NATIER, M. D.,

PARIS, FRANCE.

(TRANSLATED BY EMIL MAYER, M. D., NEW YORK CITY.)

I experience a double satisfaction in again reverting to the study of this subject, to which I have many times alluded in the past. Indeed, I deem it a commanding duty, with my thoughts fixed on that gigantic struggle of the nations, which goes on unceasingly, without limitations, shaking the very fundament of the whole world from its most ancient until the present time.

Furthermore, there is a melancholy pleasure in adding a new link, quite unexpected, to the chief causes of a malady into whose intimate nature I have given much particular attention for many years, for it so happens that it is one of the glorious victims of this war whom I have to thank for furnishing me with the theme of this communication.

Here is his lamentable history:

F., born in 1891, about to finish his military service when called upon for mobilization. Father, workman, in the port of Dunkirk, sober, good health, died of anthrax. Mother, aged sixty-seven years, good health, excessively stout, no nasal affection, no consanguinity. There were six children, the oldest dying at two months. One brother had an affection of the lungs from exposure, and recovered; three sisters in good health, and the patient.

Personal History.—Nursed by his mother, leaving his native town only when he joined his regiment; had no privations. From six to thirteen years went regularly to school. Employed

*Read before the American Laryngological Association, May, 1917.

in a silk-yarn factory until his eighteenth year. No overwork; but constantly exposed to dust. From the eighteenth to the twentieth year ship carpenter, then soldier.

As a child, scholar, workman, soldier, always in good health; no venereal affections, no headaches; his digestive, circulatory and nervous systems were absolutely normal up to the time of his injuries and asphyxiation. Respiratory system entirely normal, no nasal secretion or epistaxis, no sinus disease, no adenoids or tonsils.

October 18, 1915, he received five bullet wounds in his lower limbs. On the right side a superficial wound in the hip, one below on the calf and one much deeper in front of the tendon Achilles. On the left side, wound on the anterior portion of the abdomen; immediate removal of the projectile. Wound with an orifice below the knee, and on the external border of the left hip extending to, and having its exit in, the internal part of the leg below the calf.

Asphyxiating Gas.—Bombardment with asphyxiating bombs ("Obus"). At first, owing to poor calculations as to distance, the bombs did no damage, and the odor was but dimly perceived. Subsequently, by direction of aviators, this was rectified, and the bombs reached the trenches and great ravages ensued.

While in an open field, covered by the enemy's artillery, our patient was struck by an "Obus," and asphyxiated by the gas. He was not protected by his mask, which had dried up. He fell like a log; asphyxia followed with total loss of consciousness for several hours. Eventually he regained consciousness, followed by renewed attacks of syncope.

After about thirty-six hours he was placed in a conveyance, still clad in his clothes, soiled with vomitus and a great deal of blood. Blood mixed with greenish matter was not expelled except by hiccough. No evacuations took place. Coughing and respiration were impossible without most exquisite pain and severe burning in the stomach and chest. "Every effort of the kind tears my lungs," said the patient.

October 15th, the next day after the injuries, he was transferred to Vitry le Francois, where he was obliged to remain for three weeks, owing to his febrile condition. Skin cyanotic, respiration prolonged with great agony, lasting at least a fort-

night. Almost total impossibility of respiration; each attempt followed by severe stitching pains, extending from the nose to the bifurcation of the bronchi. Received special care, dressing of wounds. Several injections of morphin and of serum; inhalations of oxygen—only two of these were given.

November 11th, arrival in Paris at base hospital. Daily injections of normal serum and of morphin four times in the day; inhalations of oxygen; mentholated vaselin for the nose obstruction.

For the five months following the injuries there was much difficulty of respiration. For at least two months, inhalations of oxygen were repeated three to four times a day, ten to fifteen minutes each time, and though faintings often occurred after inhalations, they were followed by amelioration of symptoms.

Partaking of food by the mouth was absolutely impossible for the first six months, terrible burning in the throat followed attempts at swallowing, then dreadful vomiting from an intolerant stomach, even for milk and ices; so for two months irrigations of two hundred and fifty grams of normal serum were daily performed.

There was a permanent febrile condition, total insomnia, intense feebleness, wasting cachexia.

March 18th admitted to the Salpêtrière, service of Professor Dejerine. There was feebleness of external extremities, intense headaches, respiratory troubles; ozena and vomiting reappeared for a month following electrical applications.

Examination—Inferior Members.—All possible movements greatly reduced. Feebleness not marked on the left, while emaciation was greatest on the right. No hypotonia, no contractures, reflexes normal. Contractions of muscles normal.

Upper Extremities.—Muscular power slow and weak, reflexes normal. Respiration rapid and irregular, 120; heart and lungs normal; pulse, 104.

August 4th, absolute uselessness of lower extremities; respiratory troubles diminished.

August 22nd, strong faradic current. Galvanic current of thirty milliamperes, followed by slight voluntary movement of great toes. Attempts to move the patient followed by tremor of hips. Some muscular contracture of hips, but no movement.

October 25th, I first examined him. The two alæ, more particularly the right, were strongly collapsed, remaining in contact with the septum; otherwise very mobile. In the left nasal fossa slight atrophy of the middle and inferior turbinates. Deviation of the right bony and cartilaginous septum; concavity on the left. Mucosa dry. Right side of nose, same condition as on the left, except for greater space because of the deviation. No trace of sinusitis. There was a catarrhal state of the vocal cords. Mucous membrane of the nasal fossa markedly anemic; general sensibility normal; considerable diminution of odor; mouth perfect, dentition always; taste diminished, pharynx normal.

Vision.—Bad on the right, where nothing can be distinguished; left eye closed.

Skin.—Normal, no excessive perspiration hands or feet; excessive perspiration in arm pits.

Digestive System.—For a month after admission to the Salpêtrière has been enabled to partake of food by the mouth, although he still has eructation and weight in stomach, with some vomiting one-quarter of an hour after ingesting food. Increase in weight and disappearance of constant sensation of vertigo.

From the beginning, intestinal evacuations only once in three days. Purgations ineffectual. No desire for evacuation and inability to pass gases from rectum. Enemata were resorted to; the patient did not even feel their being used.

Nasal Respiration.—Complete stenosis from collapse of alæ from the very first. If asleep with mouth closed, he is promptly awakened by suffocation, so he became accustomed to place the ends of matches in his nostrils each night regularly to keep them apart. He was a constant mouth breather. With the mouth closed, respiration became jerky, waking or sleeping.

Ozena.—Three to four months after the injury, and for the first time, there was a manifest alteration of the nasal secretion; yellowish at first, progressively becoming thicker, and about one month later, crusty and greenish.

Expulsion of bloody crust only after great efforts, requiring hundreds of attempts for an hour; then they would eventually become dislodged.

Three weeks after this he became aware of the bad odor of these crusts by the complaint of a comrade, who repeatedly asked him if he had not "eaten cheese." It so happens that he never partook of cheese, hence his attention was directed to his ozena, although there was at this time a considerable diminution of the odor.

No olfactory sensation was awakened by inhaling eau de cologne, which produced burning sensations of the nasal mucosa like unto that occasioned from holding a lighted match close to the nose. At the same time there was burning of the eyes with lachrimation, especially the right eye.

Progressive increase of ozena; more frequent use of handkerchiefs; more frequent headaches, especially temporal. The tongue is always burning, with recurrent eruptions.

Treatment of Ozena.—In February, at the first examination at the Salpêtrière, I advised regular insufflations of warm salt water, which, in spite of the nasal pain thereby occasioned, was followed by amelioration. There was a diminution of the amount and quantity of the crusts, which were now changed to smaller bloody "leaflets" or "balls."

January 10, 1917, an abundance and the same fetor of nasal secretion; crusts formed, entered the mouth, and, the patient being unable to expel them, were swallowed. For two weeks cessation of nasal irrigations because of severe pains they caused in the nose, with a resulting increase of nasal conditions because of drying of crusts. In spite of this, respirations seemed easier; need still to maintain nostrils artificially spread or wakening with suffocation at night. More pulling sensation in the chest. Respiration decreased to sixty.

Special Alimentation.—Two liters of milk daily, four eggs and soft foods. Meat in small amounts—and, still more remarkable, veal alone was borne. All other meats, ragouts, or sauces with onion, caused a disturbance in the stomach soon after their ingestion; hypersecretion as of boiling water, very acid; the tongue became as on fire and covered by numerous white elevations. The same fiery sensation of the lips, accompanied by a more or less confluent eruption.

The very hard masses were expelled every two or three days at the cost of pain and agony each time, sufficient to bring out tears.

Spontaneous evacuations returned for the past month, since when gases passed freely from the rectum, and sensation returned to his hips. Enemata produced pain, and rather than submit to their administration, preferred to make efforts to evacuate his bowels by the hour.

Inferior Extremities.—Sensation, entirely absent following injury, shows a tendency toward return since about the past two months, plainly limited on each side to two-thirds of the upper part of the hip. At the junction of one-third of the inferior portion there is a ring surrounding the member; palpation on the surface produces a sensation of pricking instead of the simple sensation of contact. It seems as if the hip were attached by a cord that was being tightened. Walking always impossible, or with slight progress. Attempting to walk, the legs were projected in advance. This inability could in nowise be imputed to any unwillingness on the part of the patient, who, receiving no visitors, was actually grieved to remain fixed in one place, and was very happy to be able to visit his comrades.

Vision stationary.

March, 1917, though slowly, the ozena is improved with the general improvement. (This observation is of interest from several points.) The affection has shown an exceptional if not unique course.

Before the injury, not the slightest pathologic condition of any susceptibility to predispose to an offensive nose. This young man in the state of blooming good health, now bore every sign of that offensive condition.

We are justified, then, in directly tracing the causal factors to the asphyxiating gas and the subsequent functional disorders, an ozena purely accidental and at the same time so rapid in its existence.

No less curious is the pathogeny.

Above all, we note it often to occur after luetic affections. Bearing in mind my studies of the question, and which I do not retract, I have not changed my original views relative to the origin and development of ozena. To those who have forgotten, or who have not been informed of my views, it will suffice to state briefly that in my opinion ozena is not a true morbid entity, an idiopathic or real, but a unique and

always a symptomatic expression of a profound localized disturbance of the general health.

Now, in what manner does this recorded case confirm and illustrate these deductions? That is what I shall now attempt to demonstrate.

Ordinarily ozena is considered inseparable from old and far advanced atrophic rhinitis. The disagreeable symptoms I have already previously stated are the ultimate end of a disorganization, slow and profound, of various constitutional mucosa elements—blood vessels, nerves, glands, muscles, cartilage, and even bone of the nasal fossa. Similar disorganization results in a physiologic change of unusual severity of variable causes, going back often to the first years of life. That is the general rule. We must allow for exceptions. The case here recorded belongs to the former class. The atrophy is simply developed. On the contrary, on the other hand, the ozena is of recent date, is excessively pronounced, and follows almost suddenly in an adult subject. Where is the contradiction? Only in appearance; the difference is in the cause, and the affection is the same.

In my patient the determining cause was at the time sudden and violent; the effect cruel and deplorable. That the unfortunate man at the arrival of succor did not succumb immediately or in the general delay, is marvelous. How many others so stricken would have been able to return to normal equilibrium except at the price of most laborious exertions?

A young colleague, recently seen, tells me that he has never seen a case of gas asphyxiation that did not produce pulmonary tuberculosis. An experience of thousands of others. Less terrible proves to be that of my soldier. His unfortunate history in that sad physiologic loss substantiates my views, in which I persist more than ever as to the causes of all ozena.

Here viewing its nature and course, the first cause determined, the stages were particularly rapid. A wealth of evidence that the disturbance so marked of the respiratory and digestive tract proves my contention that ozena is nothing but the manifestation consummated and localized in a special part of the body, an anatomic physiologic evidence of the profound disturbance of the mucous membrane of the economy of the whole body.

Prognosis.—There is not the slightest doubt. It can only be favorable. No irreparable lesions, only functional disturbance. They become less progressively and follow the general improvement. We may count upon radical cure in accord with the latter condition.

Conclusions.—An ozena plainly of sudden origin in an adult, after grave functional traumatism, a great wound, following asphyxiating gas. The rapidity of the progress is easily explained by the disorganization, at once profound and general, of the surface affected.

Once again it is verified, and supports the assertion that ozena is but a consequence, distant more often, but also under color of exceptional events of the physiologic calamity. The cause of the latter is of less importance. Its intensity merits consideration.

This truth admitted and its verity visibly impresses me. We are compelled to discard, as I have always done in my studies of the subject, the various theories, more or less fantastic, and in particular the microbic theory, invoked to explain the production of ozena.

Logically the clinical appearance, and that only, is the guide for our information that we must be instructed in the real cause of the grievous affection which is the object of this present communication.

10 rue de Bellechasse, Paris, Ve.

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LVIII.

CARCINOMA OF THE EXTERNAL EAR WITH THE
REPORT OF A CASE.

BY FRANK WARNER, M. D.,

COLUMBUS.

Carcinoma of the external ear is of such rarity that the encountering of a single case is of sufficient importance to report. It is with this thought in mind that I present a case operated on by me over eight months ago. With a report of this case, a review of the literature is presented.

C. F., male, aged seventy-seven, first noticed a small ulcer on the helix of the left ear one month before the operation, which was on December 11, 1916. Mindful of the fact that many times a carcinoma on and above the upper lip is of the hair-matrix variety, a careful examination was made for any of the characteristic signs or symptoms of this disease, as its slowly growing nature, raised, pearly edges and superficial, though broadly infiltrating behavior, but none were found. Taking into consideration the age of the patient, seventy-seven, and the fact that he had been employed recently in work that kept him continually exposed to the sun's rays, a new experience for him, producing a sailor's skin, and the general appearance of the ulceration, the conclusion was drawn that the disease was probably carcinoma of the external ear, situated on the helix, and superinduced by the irritating influence of the sun's rays. While there was no glandular involvement, the skin was adherent to the underlying cartilage. The growth was freely removed, taking in all appearance of diseased tissue, necessitating the removal of some of the surrounding healthy skin and some of the underlying cartilage to which the ulcerating mass was attached. The histologic examination of the tissue removed showed it to be a carcinoma of the squamous celled type. While the epithelial cells had freely broken through into the subcutaneous tissue, they could be seen adjacent to the underlying cartilage, there was no appar-

ent infiltration of the epithelioma among the cartilage cells, thus demonstrating the fact that cartilage cells offer a barrier to the rapid extension of the cancerous process.

An associated infection of the ulcerating mass was clearly indicated by a pronounced leucocytic infiltration.

Over eight months have elapsed since the operation, with no appearance of a recurrence, which usually takes place within two months, and seldom after six months. That the neoplasm was not longer in its growth than thirty days is uncertain. As the man was rather frail in health, and not overly careful in his attention to personal details, his long hair laying over the ulcerating growth, my thought was that the neoplasm, before ulcerating, had probably existed longer unobserved.

As showing the infrequency of cancer of the external ear, Fisher¹ quotes the London Hospital report as stating that of two hundred thousand cases of all kinds admitted each year, but thirty cases of carcinoma of this organ were encountered in a period of ten years' time. At the St. Bartholomew's, seven cases were encountered in two years. The Liverpool Eye and Ear Hospital reports show two cases treated in ten years. The Mayo Clinic had twenty-seven cases from December 31, 1907, to October 31, 1913. In addition, Fisher collected twenty-two additional cases from the literature.

Wolffe,² in commenting on the infrequency of cancer of the external ear, quotes Haig in saying that he was able to collect only sixteen cases of tumors of any sort in this situation, while Alexander gathered from the literature fourteen cases; of these, three were fibromas, one a tuberculous granulating mass, one an angioma, three endotheliomata, three epidermoid carcinomata, two hair-matrix carcinomata, and one atheroma.

When carcinoma attacks the external ear, it is usually found to be on the posterior surface. Of seventeen cases collected by Halle, thirteen were situated on the posterior surface of the pinna and four on the anterior. It has been found, however, to be situated on the various parts of the ear, although the lobe of the ear is peculiarly free from assault. Coudray, in Wolffe's *Krebskrankheit*, reporting a single case only occurring here, and that was of the hair-matrix character (rodent ulcer). R. Haig, in the same work, observed only

one case in this situation, and that was a cancer engrafted on the border of a tuberculous mass. Occasionally, a case is encountered that is so far advanced that it is quite impossible to tell the original seat of attack. About three-fourths of the cases of cancer of the external ear are situated primarily on the pinna. When occurring on the posterior surface of the ear, many of the cases have originated in the auriculo-mastoid furrow.

Carcinoma of the external ear occurs almost exclusively in well advanced middle life or in old age, at a time when nutritional changes of a degenerative character are most pronounced. In the Mayo Clinics, quoted above, the average at which the cancer occurred was sixty-two; the youngest forty-six; males greatly predominating; in their series being seventy-four per cent, while those in the literature were eighty-five per cent. Cancer of the pinna does not occur in the young, although Bezold, in Wolffe, reported a case of angiosarcoma of the outer ear in a girl of nine years, the tumor having taken its origin from the concha.

Just as irritative influences stand as etiologic factors in the production of carcinoma in any other situation of the human organism, so here, on the external ear, anything that keeps up a constant irritation, first influences an increased production of epithelial cells, which overgrowth may eventually become lawless in their arrangement.

Inasmuch as carcinomata have frequently arisen in the auriculomastoid furrow, occupied by spectacle bows, these have been thought to exercise a causative influence.

Preceding the development of a carcinoma of the external ear, some of the cases have been the seat of an eczema, especially located on the posterior surface.

In many of the cases, cancer of the external ear was associated with a sailor's skin. As this has unquestionably stood as an etiologic factor in other situations of the exposed integumentary surface, it is only reasonable to conclude that a similar influence is exercised here on the ear by the sun's rays.

The irritative influence of a chronic suppurative discharge and of hardened ear wax is thought to sustain a causative re-

lation, yet this association is not at all constant in cases of carcinoma in this situation.

The squamous type of cell (epidermoid carcinoma), prevails over that of the hair-matrix type (rodent ulcer), in carcinoma of the external ear. The tendency of the latter type^a is to infiltrate more broadly but less deeply the surrounding tissues in any situation in which it occurs; it is slower in its progress, and is less likely to metastasize than in epidermoid carcinoma, though in either form of the disease this is not inclined to take place except late in the history of the malignancy. In either form, too, the cartilage seems to form a protective barrier against its further progress.

While glandular metastases are not frequent in cancer of this region, recurrences are much higher than elsewhere, occurring at the Mayo Clinic in fifty-eight per cent of the cases. In the literature, reference to this point is more uncertain. Recurrence takes place more quickly and more frequently when the epithelioma is attached to the cartilage than where no such complication exists. Many of these cases have been successfully dealt with by a second operation.

Inefficient removal of the growth is undoubtedly responsible for so many recurrences. The situation of the cancer on the external ear makes one hesitate to do a more mutilating operation than is absolutely necessary. As a result of this, frequently the incision stops short of the real necessity of the exacting conditions present.

The diagnosis of cancer of the external ear is not difficult as a rule. Tuberculosis and granuloma of the canal may simulate carcinoma and require differentiation. Chancres, gumma, and lupus of the external ear may lead to such confusion in diagnosis as to require the removal of a section for histologic examination, to be followed promptly, however, by complete excision of the mass, if its character is of a malignant type; otherwise the cancer may be stimulated to active growth, or permit the dissemination of cancer cells into surrounding tissue or metastasis into neighboring glands; the latter, however, being a remote possibility in recent cases, it not occurring usually in cases under four years' duration.

It is unfortunate that some patients seek relief for cancer of

the external ear only after it has been in existence for a long time. In order to make an operation for cancer successful, here as elsewhere, it must be done at a time when the entire growth can be removed completely. As glandular metastases are infrequent in the external ear, the operation offers better opportunities for complete eradication than in most other situations. The great drawback to successful removal is the difficulty of avoiding a mutilating operation on the pinna. The epithelioma is frequently attached to the cartilage, which adds some gravity to the prognosis. To make the operation successful, it is necessary to remove enough of the cartilage to insure the complete excision of the cancer, and to cauterize with heat the entire raw surface, so as to destroy and isolate infiltrating cells. It is not necessary to remove the glands unless they are involved in metastases, and it should not be done as a routine operation.

In the Mayo series of cases, reported by Fisher, four had glandular involvement; two of these were operated on, one recovering, the other died. In the literature, forty per cent showed glandular involvement; five of these cases were operated on, with three deaths. Of the three cases resulting fatally, one had a radical removal of the glands, while the two recoveries had a complete removal of them. Sixty-seven per cent of the Mayo series, without glandular involvement, recovered; in the literature, fifty per cent. There seems to have been no glandular involvement of a malignant type in any of the earlier cases, Fisher reporting it only in cases of at least four years' standing, with seventy-one per cent of the cases showing a primary involvement of the pinna. In his series of cases not cured, all were adhered to the cartilage. Unfavorable conditions to an ultimate cure are, actively growing neoplasms, adhesions to the cartilage and wide or extensive infiltration. As epitheliomata of the external ear are resistant to treatment, an operation should be done early when the greatest prospect of cure is at hand, and the incision made sufficiently generous to make probable an absence of recurrence. Unless it is practicable to remove the neoplasm at a reasonable distance from its attachments, on account of making a too mutilating opera-

tion, radium should supplement such operation as one is able to make, first employing the actual cautery.

If an observation of six months fails to reveal a return of a cancer of the external ear, a cure may reasonably be depended upon.

SUMMARY.

1. Cancer of the external ear is of infrequent occurrence. Fisher collected twenty-two cases from the literature occurring in different parts of the external ear and presented twenty-seven cases from the Mayo Clinic.

2. Three-fourths of the cases of cancer of the external ear occur on the pinna.

3. While occurring on different parts of the external ear, carcinoma generally attacks the posterior surface; less frequently, the anterior, occasionally some part of the rim, and in one case, the lobe of the ear.

4. Epitheliomas of the external ear occur in males in seventy-eight and one-half per cent of the cases.

5. Cancer of the external ear, exclusive of the external auditory canal, occurs only in advanced life or in those well into the middle period, when nutritional disturbances of a degenerative character are usually present.

6. Irritative influences, here as elsewhere, are responsible for the initiation of a malignant neoplasm. Eczema, spectacle bows and sailor's skin are all thought to be occasionally responsible for the growth.

7. The epidermoid type of carcinoma prevails over that of the hair-matrix or rodent ulcer form.

8. Insufficient removal is responsible for many of the recurrences; fear of a mutilating operation is usually responsible for the insufficient removal.

9. After the removal of the growth, the surface of the wound should be gone over with the actual cautery.

10. If the surface is broadly infiltrated, the operation should be followed up with the use of radium.

11. Glandular involvement is not usual, and it is a late complication when it does occur. Out of twenty-seven cases in the Mayo series, it occurred four times; in the literature, forty per cent of the cases showed this involvement. In the former

cases, it did not occur in any of them which had been in existence less than four years.

12. In cases of supposed eczema of the external ear occurring in advanced life, one should be thoroughly alert for cancer; if found, operate early enough to be a real service to the patient.

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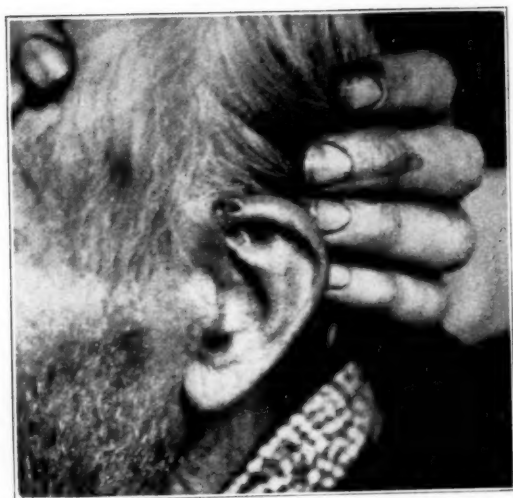


FIGURE 1.

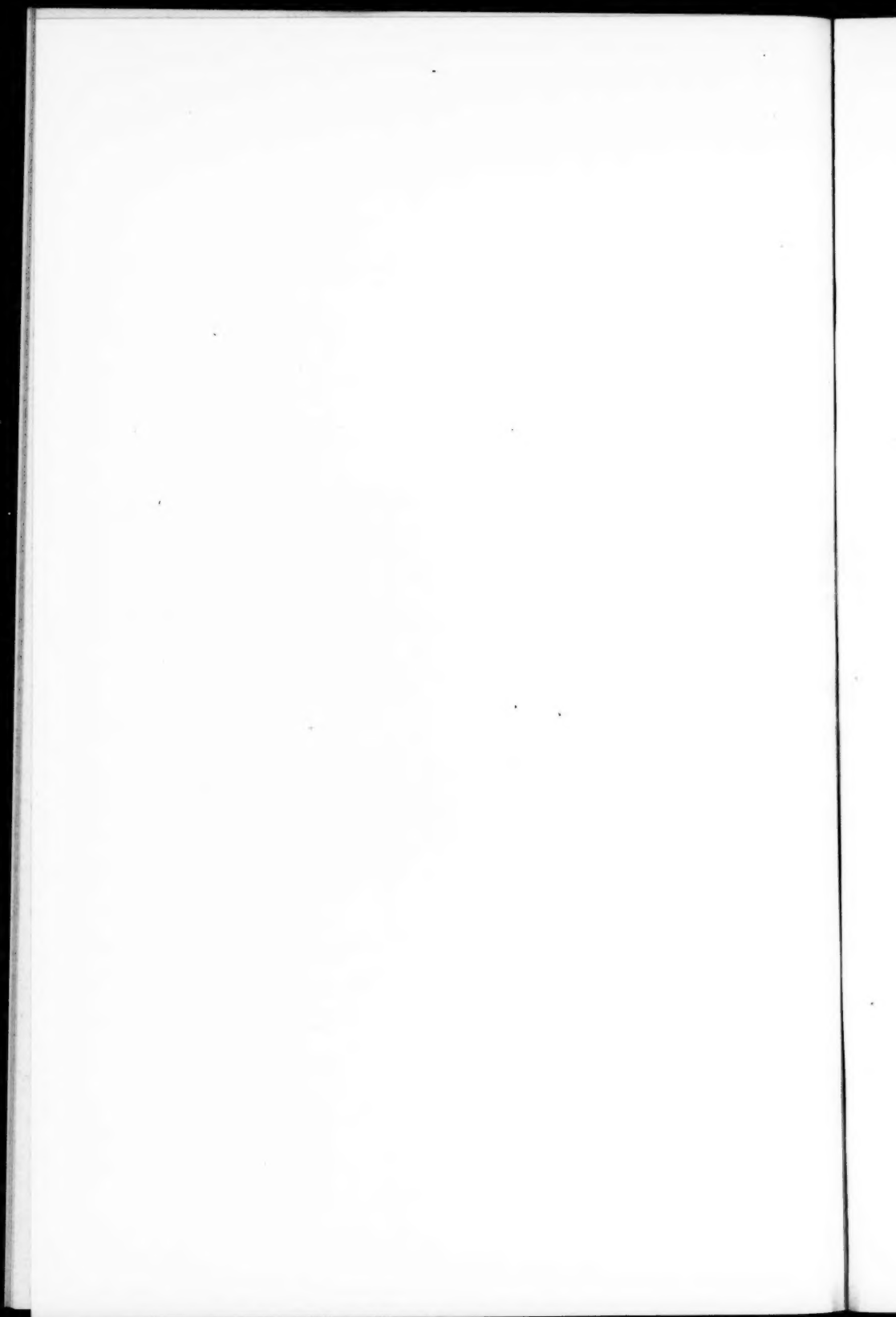
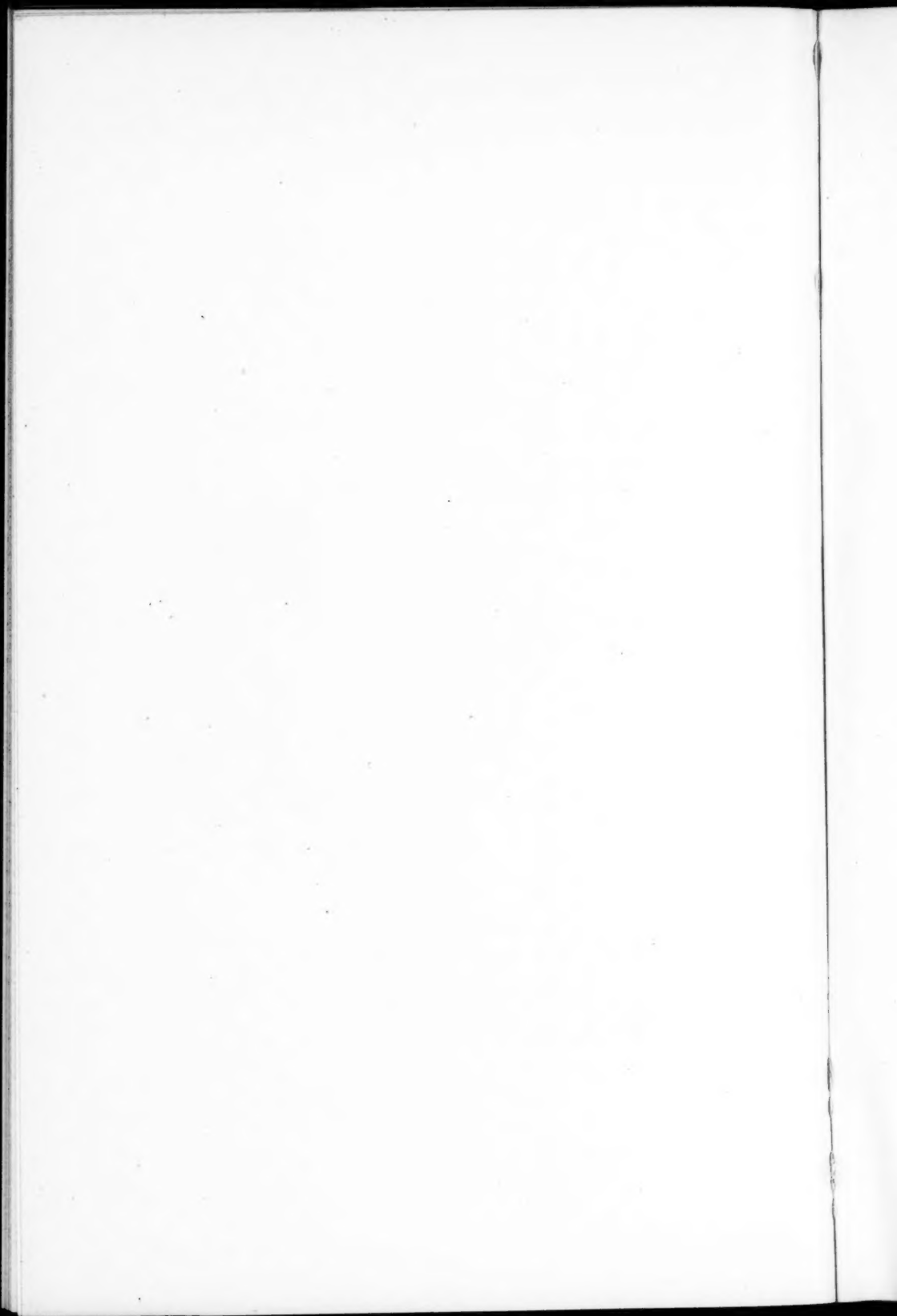




FIGURE 2.



LIX.

ABSCESS OF THE LUNG FOLLOWING OPERATION
ON THE TONSILS AND UPPER AIR TRACT.*

BY CHARLES W. RICHARDSON, M. D.,

WASHINGTON, D. C.

It seems unnecessary for me in this paper merely to call attention of the members of this society to the papers that I have written bearing upon this subject before other organizations, as I feel that they have been quite generally read. On March 20, 1912, I believe I first called attention to this condition as a complication of tonsillectomy. Since the publication of my paper on "Abscess of the Lung, following Operations on the Upper Air Tract," in the *Laryngoscope*, July, 1916, I have received a number of communications from observers throughout the country, stating that they had met with this untoward experience in their tonsillectomy work. Having been established that this serious complication is not now an unusual sequela of operative work, it therefore, becomes incumbent upon us to ascertain the manner of its occurrence, and to consider wherein we may adopt alterations in our methods or technic by which it may be prevented.

To all observers it must be patent that this complication has largely come under our observation since we have adopted the more radical operation of tonsillectomy in dealing with enucleation of tonsils. It must also be patent to every one that while we do a great many more radical operations upon the sinus than formerly, in which there is free pus, granulation tissue and infective débris, which must in certain amounts gain ingress into the air tract, yet we do not find that lung abscess in an increasing factor in these operations.

What is the probable etiologic factor that enters into the causation of this complication?

*Read before the American Laryngological, Rhinological and Otological Association, May, 1917.

Under the various causes assigned as the factors in producing pulmonary abscess are:

First. General anesthesia.

This is only a remote factor, in that the anesthetic irritates the pulmonary mucous membrane and renders it more susceptible to the invasion of pathogenic germs that may have gained ingress, and, through rendering the patient unconscious, it lowers the expulsive reflex, thus lessening the great natural defense to the protection of the air tract.

Second. The want of thorough examination and preparation of the patient.

This factor should never enter into the causation. I was astonished in my reading of the report of the New York Academy of Medicine, Section on Laryngology and Rhinology, meeting of January 26, 1916, of the discussion on this point. There is and can be no excuse for the want of examination and preparation of patients about to enter into operative procedure upon the upper air tract. My patients are always examined physically. The orders for the preparation are always written out and given to each patient with injunction to follow explicitly. I have never had a patient to vomit on the table. The bowels are always freely opened, and they have no food for at least eighteen hours before the operation. The urine is always examined.

Therefore, after a most thorough consideration of this subject, it seems to me that the method of invasion is either indirect, through the lymphatic or venous system from the wound surface, or direct, through the inspiration of pus or bacterially laden caseous material into the pulmonary tract. By whatever method we perform this operation there is more or less squeezing of the tonsils so that contained pus or masses of cheesy debris are forced out from the substance of the tonsils or from the diseased crypts. Even while making the incision to liberate the folds of the tonsils, we have on numerous occasions observed pus, more particularly cheesy concretions, floating out on the surface of the tonsils. This occurs almost as frequently with children as with adults. By whatever method we perform the operation, we necessarily open up numerous lymphatic vessels and moderate size veins,

and leave a deep wound surface which is bathed in the abundant flora of the faucial cavity.

If these are the two important factors which I believe they are, we should make all efforts to minimize their effect by lessening the amount of trauma as far as our operative skill will permit, and through adopting all methods to prevent the ingress of pus or cheesy material from the tonsils into the pulmonary tract.

I had hoped through the various improvements of my own technic to exclude this complication from my operative risks; but my work during the past year has shown me that I have not succeeded. In spite of my depression of the patient's head, through the raising of the foot of the operating table thirty-five inches, and the use of the suction ether apparatus of the Beck-Mueller design which has always worked most satisfactorily—I have had one abscess formation. One interesting feature to me in this connection is the fact that I have never seen an abscess of the lung following an operation upon the upper air tract in a child under fourteen years of age. In the Children's Hospital, in Washington, in which the entrance age is under twelve, and wherein I do for six months all the open ward, and throughout the year many of my private children patient's operations for tonsillectomy, and where we do not have the advantage of the suction ether apparatus, I have never had a pulmonary abscess.

All my adult operations are done at the Episcopal Eye, Ear and Throat Hospital, as well as some of the older children, under the greater advantages of position and suction. The number of my operations done in each institution is about equal. Is there some anatomic relation in the fauces, or is the resistance power in the lungs in a child greater, which renders it less susceptible to this type of infection than the adult?

From the fact that children seem totally unsusceptible to this type of infection, from the fact that infection occurs as a result of submucous resection, which is an absolutely clean operation, and that it does not transpire with any degree of frequency after opening up such pus bearing fields as the nasal sinuses, I am still inclined to believe that this complica-

tion occurs in the fair proportion of cases by infection through the lymphatic or venous channels. Another strong factor that points to this manner of infection is the fact that most of the abscesses that I have seen radiographed have apparently developed between the lobes of the lung—probably from the interlobular lymph spaces.

With these facts before us, should we not seek to modify our operative procedure upon the adult? Is the patient under general anesthesia more susceptible to this form of infection than under local anesthesia? Is the occurrence of faucial and deep cervical infection, after local anesthesia, as frequent and as dangerous to the patient as the occurrence of occasional lung abscess in the general anesthetized adult? The above question can only be answered after a thorough survey of the situation and upon better knowledge of the advantages offered through the two methods that we now possess.

SYMPTOMS OF LUNG ABSCESS FOLLOWING OPERATION UPON THE
UPPER AIR TRACT.

The earliest and most characteristic symptoms is that the patient does not make a favorable convalescence after the operation. The case progresses favorably with regard to local manifestations, but the patient seems languid, somewhat dispirited, and inclined to remain abed. Usually from the fourth to the tenth day positive evidence of pulmonary invasion makes itself manifest. We have irregular septic temperature, sharp pain in the lung, and violent paroxysmal coughing. Occurring at the same time, or shortly thereafter, we have the pathognomonic evidence of pulmonary abscess in the expectoration of a free pus which has a foul odor. This foul odor is intensely distressing to the patient and is noticed by them, not only with the expectoration of the pus, but also during coughing. In some cases the odor is noted by the patient some hours before the expectoration of pus. In the early stages, and frequently throughout the case, the foul odor is only noted by the patient. The physical signs at this stage are very meager, depending upon the size and location of the area involved. These signs are dullness over the area affected, diminished breath sounds, and crepitant or subcrepitant rales. There is no doubt that some cases at this stage are supposed to be ether

pneumonia. With the development of the abscess we have characteristic symptoms manifested—viz., the expectoration of pus, pain, greater or less actual hemoptysis, and foul odor. In the several cases which I have had under my observation, although the patient complained bitterly of the odor, the odor of the breath was never noticed as disagreeable, although the expectoration from the same patient had a distinct, unpleasant odor. The cough persists, nausea is frequently present, the fever becomes septic, the fingers club and the patient gradually loses flesh. The physical signs at this stage are those of lung abscess. Radiograms taken at any time will show the graphic evidences of the abscess.

Treatment.—The management of pulmonary abscess may be considered under three classifications—viz., medical, or expectant; surgical, or compression of the lung by artificial pneumothorax.

In a small percentage of cases when the abscess is located in the upper lobe of the lung and the drainage is into a large bronchus, and where the case is apparently following a favorable course, the medical expectant treatment may be followed. It is well to have in mind the fact that the percentage of mortality is very great by this line of treatment, approximately sixty per cent, and therefore it must not be pursued for too long a period.

The surgical method, consisting in rib resection, fixation of lung and drainage of pus, gives a much better result than medical treatment, the mortality being approximately thirty per cent. The more radical surgical procedure of excision of portions of lung containing the abscess cavity, indeed of one or more lobes, has been attended with excellent results. The surgical treatment has offered the best results heretofore, although with a fairly high mortality and frequently a prolonged drainage before the case is brought to resolution.

Artificial Pneumothorax.—By this method we have apparently the ideal, rational and most acceptable method of treating acute pulmonary abscess. As is well known, the method has been for a long time used with more or less marked success in the treatment of chronic pulmonary abscess. Dr. W. D. Tewksbury, superintendent of the Washington Tuberculosis

Hospital, I believe, was the first to suggest its use in acute pulmonary abscess, although he gives credit to Dr. A. E. Greer, to priority in the publication of a single case of interlobar empyema following pneumonia, treated by compression of the lung with nitrogen. Dr. Tewksbury in his production of artificial pneumothorax employs air instead of nitrogen.

Dr. Tewksbury in a paper read before the Medical Society of the District of Columbia, entitled, "Acute Pulmonary Abscess Treated with Artificial Pneumothorax," November 8, 1916, gives the results of treatment in his first two cases. He has kindly furnished me with the data and results obtained by him in treating acute pulmonary abscess since the publication of his above mentioned paper. In the past ten months he has seen ten cases of acute pulmonary abscess, nine of which followed operative treatment upon the upper air tract, by eight different operators, in eight of which he employed artificial pneumothorax. In two cases expectant treatment was attended with resolution. It is interesting to note that these cases were operated upon by eight different operators, each employing a slightly different technic, so that the result cannot be assigned to a universally employed technic. These results also demonstrate quite a large proportion of lung abscess for a community as small as Washington, and bear out the statement that I made in my paper read before the American Climatological and Clinical Society, May 9, 1916, "but while these remote lesions are rare, I am convinced that they are not so infrequent as one would judge from reports hitherto made from the domain of laryngorhinology."

Dr. Tewksbury's conclusion is as follows:

Of the eight cases treated by artificial pneumothorax, six were acute lung abscess of a month or less duration. Of this number four recovered, one is recovering (at this writing well), and one died. Two were chronic lung abscesses of over a year's duration. Both improved, but were not cured.

It is apparent that in order to get cures in these cases it is necessary to use pneumothorax early while the abscess is soft and compressible.

LX.

REPORT OF INTERESTING NASAL CASES DUE TO
SYPHILIS. REMARKS ON OBSCURE SYPHILITIC
NASAL SYMPTOMS.*

BY DUNBAR ROY, M. D.,

ATLANTA.

Obscure syphilitic manifestations in the nasal cavities are much more frequent than many of us suppose. Since the introduction of the Wassermann test the writer believes that we have made ourselves too dependent upon it as the final test in diagnosis, to the exclusion of clinical symptoms which are so important in the management of pathologic conditions. The following case is presented in detail as affording many points of interest to the neurologist, the internist, as well as to the rhinolaryngologist.

Mr. E. E., aged fifty-one years, cotton merchant. Patient had always been strong and healthy, never having had a severe spell of illness during his life. Is temperate in both drinking and smoking—in fact, seldom takes a drink. Has lived in Atlanta most of his life. His father and mother are both living, and both in excellent health. In August, 1902, he moved to Shreveport, Louisiana, to represent a northern firm as their cotton buyer. In that city he seemed to enjoy good health, remaining at his usual weight of one hundred fifty pounds. Patient was not over four feet nine inches in height. He spent each summer in Atlanta, returning to Shreveport in the fall. During the winter of 1903-04 he did not feel in his accustomed good health, and along in the spring of 1904 he began to have neuralgia and drawing sensation in the muscles in the back of his neck. In May, 1904, he returned to Atlanta again to live, having made new connections in the cotton business. On arriving in Atlanta he consulted his physician on account of this severe neuralgic pain in the back of his neck. His appetite was not good, and he was already beginning to lose flesh. Being a neighbor and a warm personal

friend of mine, I saw him quite frequently, but in an entirely nonprofessional manner. In this way I noted his gradual decline. His physician attributed the trouble to muscular neuralgia, as a result of malarial intoxication. He was now treated steadily, but without improvement, while the pain gradually extended down into his shoulders and arms. These pains grew to be excruciating and would come upon him in paroxysms. His digestion and appetite were poor, and his nightly sleep very much disturbed. Not improving, he called in another physician (which is characteristic of a great many patients, and we can hardly blame them), who took charge of his case. He also attributed the cause to malaria, and immediately began to dose him with various medicines, changing the same from time to time. He was put upon a strict diet, and his liver was kept very active. Soon a derangement of the function of this organ was diagnosed as playing a prominent rôle in producing the various physical ailments. The patient was blessed with an excellent nurse in the shape of his wife, who rubbed and massaged him with various liniments and looked after his every physical and mental comfort.

The pain, however, did not subside, but was extending still further down the patient's back, and even into his legs. At no time were there any signs of paralysis, and the patient was able once a day to go to his office and remain for a few hours.

In giving the history the patient told me that his physician made a thorough examination of his secretions, urine, etc., and found nothing abnormal. The pains in the shoulders, especially the left, and in the back were sometimes accompanied by such spasms of the muscles as almost to draw the head to the shoulder. In September, five months later, as he was not improving, but seemingly growing worse, becoming weaker each day, losing flesh and the pains being so severe as to render sleep impossible except for a few hours at night by means of codein, he consulted a renowned osteopath, who told him it was due to the nerves from the spinal column. He gave him three treatments a week and put him upon a still more restricted diet. This treatment he continued for a month, having discarded all medicines except certain mineral waters

suggested by friends. At the end of this time he was no better in any respect, the pains not having been relieved, they being now in the legs as well as in the arms, and accompanied by the most violent spasms. At this point the patient began to be hoarse, but without cough or expectoration.

During a social visit one evening he remarked that he had taken a severe cold, and if he did not get better was coming to me professionally. In the meantime he continued to have thorough bodily massage, but was dependent upon medicine to bring sleep. It was frequently remarked among his friends that Mr. E. looked like a doomed man, and they believed that he would live but a few weeks. On my return to the city after the Christmas holidays, his wife telephoned that Mr. E. wished to consult me in reference to the severe cold in his head and throat. Being a personal friend and a neighbor, I was really sorry that the patient had come to me for professional advice and treatment, for with his previous history in regard to his medical treatment (of which I was cognizant) I felt that I could do but little for him now that he seemed in the last stages of some obscure nervous disease.

When he came into my consultation room he was so weak, feeble and emaciated that I felt as if he would never be able to return to his home. His weight then was ninety-five pounds, having been reduced from one hundred and fifty. He had no signs of paralysis, his reflexes were normal, and his only complaint being the intense pain and spasms in the legs and arms, accompanied with the gradually increased weakness.

Two weeks previous, according to statement, he contracted, in addition to the hoarseness, a cold in the head, and this had gradually kept up until at present it was quite disagreeable, he having hardly sufficient strength to blow the tough secretion from his nasal cavities. His throat, also the larynx, worried him considerably by being so tight as to interfere with his breathing, especially at night.

Examination of Nasal Cavities.—At the mucocutaneous surface in both nostrils the parts were thickened and inflamed from irritation produced by the nasal discharge. The right cavity seemed pretty well filled with mucopurulent secretion. After shrinking the tissues with cocain and adrenalin, and by

assistance from both patient and myself, the cavity was fairly well cleaned. Far back on both septum and middle turbinal there was a dirty yellowish membrane covering the parts which extended also into the nasopharynx. A slight manifestation of the same condition was found on the left side, but not quite so marked. The parts bled when some of the membrane was detached. By means of cotton on the end of an applicator I detected roughened and exposed bone high up on the septum at its posterior free border, and also the same condition at the posterior end of the middle turbinal on the same side—i. e., the right. None was detected on the left. The pharynx showed nothing abnormal, but there was a large amount of tough yellowish mucopurulent secretion coming down from the nasopharynx and clinging to the postpharyngeal walls. It was impossible to inspect the nasopharynx on account of the relaxed condition of the palate and the gagging produced in my efforts to use a palate retractor.

On inspecting the larynx I found a beefy-red swollen condition of the whole laryngeal mucous membrane, the cords being of the same general color. The membrane there and further down in the trachea seemed to be producing a tough, membranous secretion which it was impossible for the patient to expel. It gave the sound of a "croupy cough." He had no pain either in his throat or nose, but complained some of a pain just at the base of the nose over both frontal sinuses. Transillumination of these sinuses showed no shadow at any point.

The objective picture here presented was to me quite significant of a specific condition, but close inquiry elicited not one ray of such a history. I am sure the patient would gladly have told me if such had been the case, knowing that the treatment then would be much more effective. I knew him intimately, and there were few men who lived a life of more sobriety. Even before his marriage he was never given to the slightest dissipation. The only other condition which such symptoms were likely to represent was tuberculosis, and this to me almost seemed the correct diagnosis. I had the secretion from the nose and throat examined, but this was negative for tubercle bacilli. The loss of weight, hoarseness, slight cough,

were symptoms quite significant, especially after the negative specific history. However, I knew that histories were often uncertain, and as an experiment in conjunction with the local treatment of cleansing and nitrate of silver applications, I put the patient on the following treatment: On account of the poor appetite and atony of the gastric function, he was given ten drops of equal parts of tincture of *nux vomica* and compound tincture of gentian in a little water and corn whisky before meals. After meals he was started on five drops of a saturated solution iodid potash in one-half glass water, and this was increased one drop every other day. In the morning and afternoon he was given an expectorant mixture of carbonate of ammonia, fluid extract of squills, etc., this being used to soften and aid the expulsion of the tracheal and laryngeal secretion. He was not limited to his diet, but told to eat as much nutritious food as possible. He was also to use a douche of warm saline solution in the nasal cavities three or four times daily.

The next day being very cold, patient did not report, but his wife telephoned me that a swelling had developed just at the root of his nose, accompanied by some pain on pressure. In the evening I called and found the patient sitting up in a big chair with a swelling, puffy and globular looking, about the size of a walnut, just at the root of the nose. It had developed slowly during the day. I advised hot fomentations every hour, a good saline internally, and the other treatment to be continued as prescribed. The next day when seen, the edema or swelling had extended to the lids of both eyes until they could not be opened and even down on the cheek and nose. The original point of the swelling was beginning to subside. The following day, Dr. Block, a neurologist, was called by me in consultation. Dr. Block made a very thorough physical examination of his heart and lungs, muscles, nervous reflexes, and urinary secretions. This latter was found to contain a trace of albumin but no casts.

Dr. Block was unable to suggest anything further except to give the patient a mixture containing the bromids, to be taken at night for his extreme nervousness. Edema remained

limited to the face, and this gradually disappeared entirely in one week.

From this time on the patient began to improve and the internal remedies were never changed, the iodid being increased to fifty drops three times daily. I saw him at my office every other day, cleansed thoroughly the nasal cavity, touched the necrosed condition in the nose and nasopharynx with a strong solution of nitrate of silver, followed finally with a covering of aristol powder. Inhalations of terebene in benzoinated albolene were given for the larynx and trachea. One morning about three weeks after the beginning of the treatment, the patient blew from his nose a mass of secretion and a small piece of bone which proved to be a part of the vomer.

The patient was treated at gradually varying intervals until August 1, 1905—i. e., seven months—when he was dismissed, apparently cured except that he was still hoarse from the hypertrophied condition of the laryngeal mucous membrane. I tried astringents and sprays, but this seemed to do but very little good. The medicine was never changed during the whole course of treatment, the remedies being gradually left off with the improvement of the patient's condition.

December 28, 1905, one year after I first saw him professionally, he weighed one hundred and fifty pounds, and with the exception of slight hoarseness he was as well and as strong as at any time during his life. There was no discharge in either the nasal cavities or the nasopharynx. Up to the present time there has been no further trouble. He has been in the best of health now for fourteen years.

Remarks.—This case presents many interesting as well as obscure features. In the beginning of the patient's trouble there were some symptoms of a malarial neuritis; in fact, all the physicians consulted during the first months of his illness attributed the cause of his indisposition to malaria. The very first symptom noted by the patient was a general feeling of malaise and loss of appetite. This occurred during the last months of his residence in Shreveport. In May, 1904, he returned to Atlanta weakened in health and suffering with drawing pains in the muscles at the back of his neck. There was never any rise in the bodily temperature throughout the course

of the disease, nor was there at any time signs of paresis in any portion of the body. It is just possible that a slow grade multiple neuritis might produce some of the symptoms in this case, but my own observation and that of other observers would not lead us to such a conclusion. For indeed at no time during the illness was there signs of paresis, but most prominent were the signs of spasms and intense neuralgia of the sensory nerves.

The diagnosis of malarial intoxication was certainly a most natural one, and it is still a question in my mind whether the beginning trouble could not have been attributed to this cause.

The brilliant result obtained by the internal administration of iodid of potash almost compels one to acknowledge the specific basis of the whole constitutional derangement, and yet with the exception of this one fact, the good results obtained by the internal administration of the iodids, there was absolutely no history or symptoms to warrant us in drawing such a conclusion. I examined him thoroughly at the time, and even since then there has not been the slightest signs of glandular enlargement of any portion of the body. No falling out of the hair, no symptoms of sore throat, no obscure pains at night, absolutely nothing to warrant us in suspecting syphilis as the cause. So foreign to my mind was syphilis as the cause of the nasopharyngeal ulceration at the time of these very active symptoms, that I concluded the ulceration was without doubt tubercular, on account of the great loss in weight and the seeming involvement of the bronchial tubes. However, Dr. Smith, an excellent pathologist, made a thorough examination of the secretion with absolutely negative results. His mother had been treated for years for a superficial skin cancer on the forehead and this is still under the constant observation of a dermatologist.

Another symptom which was misleading to me was the existence of an odor from the nose in nowise characteristic of that experienced in the cases of late tertiary syphilis, where the odor is exceedingly offensive, and especially where there are areas of necrosed bone. While many things point to the correctness of our diagnosis, we must remember that the administration of the iodid of potash often proves of benefit and

even curative in cases other than syphilis as, for instance, an alterative in various conditions where we can give no better name than "blood dyscrasia", this remedy is often of marked value. As an adjunct to the relief of various inflammatory exudates in the body, I know of no one remedy that is of greater value.

Consequently, because the case responded to the iodid of potash, and seemingly was brought to a successful issue through such administration, is no self-evident proof that we were correct in our diagnosis.

The question could very naturally arise, was malarial intoxication the primal cause of this physical derangement, and did its presence in the system so impoverish the blood and thereby the nerve tone as to produce the train of symptoms which occurred throughout the course of the disease? In my own mind there is such a possibility, and yet in studying the literature of any similar case reported, I can find nothing which would lead me to such an affirmative answer. After all that can be said, the history of this case and the results obtained by the treatment certainly bear out the probable diagnosis of its specific character.

Another case evidently specific in character, occurring in my practice several years ago, had many obscure points in its diagnostic history and yet the final results must lead us to the same conclusion as was obtained in the first case.

The second case is that of a Mrs. M., aged fifty-five years, widow. This patient was a woman of most excellent standing. She was the mother of four children, all of whom were unusually robust in their physical growth. The family history precluded any idea of specific taint. The father and husband died several years ago of typhoid fever. The patient had always enjoyed the best of health and had never suffered from any of the feminine complaints.

Present History.—In April, 1903, patient consulted me on account of cold in the head which had been present for two weeks and which did not improve after the use of all the ordinary remedies. Her chief complaint was a stuffiness and inability to breathe comfortably through the nasal cavities. There had been some symptoms of tenderness about the ex-

ternal part of the nose whenever the handkerchief was used. With this exception her general health was perfect and there had been no signs of constitutional derangement.

Examination showed some swelling of the whole outside of the nose, giving her the appearance of the so-called "frog-face." Nasal respiration was difficult, producing the whistling sounds so characteristic of an intranasal swelling. On examination with reflected light the anterior part of the septum was thickened and edematous, resembling very much the appearances seen in an abscess of the septum. This could not be reduced to any appreciable extent by the use of cocain and adrenalin. The outer walls, including the turbinates, were only slightly swollen. There was no history of traumatism. This was before the time of the Wassermann test, and hence this could not be used. The question of malignancy could very readily be suggested. There was no bleeding when the septum was touched, and only the thick leathery sensation was imparted to the nasal applicator. There was very little space left between the septum and the outer walls. The pharynx and nasopharynx were absolutely normal in appearance. No glandular enlargement could be elicited. However, the latter seemed to me the most probable diagnosis from all the clinical features of the case.

Treatment and Results.—The patient was placed upon rapidly increasing doses of the iodid of potassium. The fact that this medicine was tolerated with the greatest ease indicated somewhat that the condition would respond to this line of treatment. Almost immediately the parts responded, and in a few days the patient began to loose the stuffy feeling in the nose and respiration became much easier. No other treatment was used with the exception of an oily spray, which was only for comfort.

The treatment was continued for three months at the end of which time the nasal cavities were perfectly normal in appearance, and up to this time, thirteen years, there has been absolutely no return of this or any other condition resembling a complication of specific dyscrasia.

Remarks.—Of the certainty of diagnosis there of course may be some difference of opinion, but the results obtained by

the use of the iodid of potassium would rather indicate the specific nature of the affection. As was stated at the beginning of this paper, the writer believes that there are many obscure lesions in the nasal cavities which have their dependence upon syphilis. It is not always necessary to look for ulcerations and even destructive processes in order to have a picture of nasal syphilis. Manifestations of specific lesions in the nose resemble many other affections, and the fact that we sometimes get such poor results in intranasal operations may have its real cause in a failure to recognize a constitutional systemic dyscrasia which in one word is syphilis. The rhinologist who waits for typical textbook pictures of lesions, or is entirely dependent upon clinical tests, will fail in many instances to bring about a successful result. The obscure ramifications of the syphilitic virus are manifold in character, and we can never be too diligent in instituting antispecific treatment, if no other cause for the condition can be found.

Congestion and edema of the nasal mucous membrane, as is sometimes found in the early stages of syphilis, very frequently resembles those cases of vasomotor rhinitis in all its manifold symptoms.

A typical case of this kind occurred in my practice three years ago. Mrs. E. E. L., aged forty-four years, consulted me in February, 1915, with what she denominated a severe cold in the head. Patient was confined to her bed, complaining chiefly of the inability to breathe through the nose, frontal headache, sneezing, all the symptoms of acute rhinitis. Patient said she had been having periodic attacks of this kind for the last year.

Examination showed congested and edematous turbinates with a serious discharge. Under local applications of cocain and adrenalin the membrane was with difficulty contracted. The writer has always found such a condition characteristic of vasomotor rhinitis and syphilitic congestion. Ordinary rhinitis will show contraction immediately under cocain applications, thus differing from the two former conditions. The usual treatment was instituted, but with very slow and imperfect results. The patient was under the writer's care for several weeks, and it was only by continuous treatment that

she was made even partially comfortable. The greatest complaint was the stenosed condition of the nasal cavities at night. This was relieved during the day, especially when the patient was out in the open. This symptom being characteristic of vasomotor rhinitis, it seemed as if this latter condition was the proper diagnosis. However, the patient's progress was exceedingly slow, and there were repeated exacerbations of all the nasal symptoms. An examination made two months after the first observation of the patient revealed a small superficial ulcer on the septum opposite the middle turbinate on the left side. Syphilis had not been suspected on account of the excellent social standing of the patient. A Wassermann was immediately made which was returned plus three positive. This patient was immediately placed upon rapidly increasing doses of the iodid of potassium, with a corresponding improvement of her condition. The ulcer healed immediately, and complete relief from all the symptoms of nasal stenosis rapidly disappeared, together with the accompanying vasomotor disturbances.

It is now three years since this attack and the patient has had no further trouble.

In conclusion the writer cannot urge too strongly the importance of the syphilitic virus as the fundamental cause of many obscure rhinologic conditions which resist the ordinary treatment. Nor should we be governed entirely by such tests as the Wassermann in directing us to the proper line of treatment. During the last twenty years the writer, as the head of a large free clinic, where the majority of patients are negroes, and where he has seen syphilitic lesions of every known variety, has adhered entirely to the old treatment of iodid of potassium and mercury, and with few exceptions the results have been entirely satisfactory if this treatment is given from year to year.

Grand Opera House.

LXI.

REPORT OF A CASE OF MENINGITIS WITH SOME
UNUSUAL FEATURES.*

BY CHAS. E. PERKINS, M. D.,

NEW YORK.

The following case is reported in the hope that on account of some uncommon features it may be of interest to the society.

Wm. G., aged nineteen years, was admitted to Dr. Dench's service at the New York Eye and Ear Infirmary, under the writer's care, on August 13, 1917, with the history of having had a discharge from the left ear since an attack of measles nine years previously. The discharge possessed odor, varied in amount, but was more or less continuous.

On admission, the patient's temperature was 103° and he appeared very sick. There was nearly complete absence of the drum membrane, no apparent sagging of the canal wall, the otoscopic examination indicating nothing as to the severity of the process. The discharge was rather scanty and a smear showed mixed infection.

The mastoid did not seem tender, and there was no post-auricular swelling or edema. No headache, stiffness of the neck, or Kernig. He answered questions readily and rationally and his mental condition seemed good. Hearing left ear, whisper, three feet; right ear, whisper, ten feet. Caloric reaction positive on both sides. No nystagmus, vertigo, or over-pointing. Blood showed leucocytosis of 28,000; polymorphonuclears, percentage of eighty-six. Culture proved negative. Spinal fluid flowed under about normal pressure, but was so mixed with blood that the cell count was of very slight if any value. It contained 658 leucocytes to the cubic millimeter. Dr. Dixon thought that the white cells were in greater number than could be accounted for by blood admixture. The culture of this fluid was negative. The globulins were present, Fehling's positive—i. e., sugar was present. Wassermann

*Read before the New York Academy of Medicine, Section on Otology, December 14, 1917.

negative. Spinal fluid on two subsequent occasions contained too much blood for a count; contained globulins, Fehling's plus. Negative cultures. Dr. Dixon's report on the X-ray was: "The right is a very large clear pneumatic bone; the left a sclerotic looking bone with an appearance of epidural abscess in the middle fossa."

A thorough examination of the patient showed absence of any disease to account for his condition outside of the mastoid, so operation was determined upon. On the following day he developed a postauricular swelling, noticed just before operation. His temperature on this second day had mounted from 102.4 in the morning to 105 at noon.

Operation.—Upon making the initial posterior incision there was a hissing sound caused by the escape of foul smelling gas and pus. A regular radical operation was done. The sinus plate was removed, showing a perisinus abscess with collapsed sinus. Large exposure of dura in the middle fossa revealed nothing abnormal except a collection of cheesy-like material in the region of the tegmen tympani.

Smear culture of the mastoid pus gave a large number of germs, fusiform bacilli predominating and a few streptococci.

Morning following operation temperature dropped to 101° and patient seemed better; 12 m., 104.6°; 4 p. m., 100°; 6 p. m., 105.8°. Blood contained 30,000 leucocytes; 81.1 per cent, polymorphonuclears. Culture proved to be negative. At this time, on account of the marked remittance of the temperature and the absence of symptoms of meningitis, as well as the condition of the sinus revealed at first operation, jugular resection was done. The outer wall of the sinus was necrotic, and the sinus contained a dark, foul smelling fluid; bled freely from both ends.

The following morning, the 15th, the temperature was down to 100.6°, rose again at noon to 104°, evening still higher, the jugular resection having apparently no effect either way. He also developed a jerking of the arm and leg on the opposite side, and it was evident that their power was much impaired. He became drowsy. On the 16th he was still worse, and I believed all had been done for him that could be. Nevertheless, on the 17th I did a decompression and, as shown at autopsy, stopped just short of evacuating the large accumulation of pus over the motor area.

His temperature during the last two days of life varied from 104 to 107 degrees, just before death on the afternoon of the 17th.

Dr. Dixon's notes of the autopsy follow:

W. G., nineteen years, No. 13615.—Service of Dr. Dench; died August 17, 1917.

Autopsy made 7:30 p. m., August 17, 1917: Superficial examination showed site of mastoid operation, also operation for resection of the internal jugular vein, both on the left side. When the skull cap was removed, the dura was found to be considerably thickened and adherent about the edges of the mastoid wound. When the dura was removed a great quantity of exceedingly foul pus was found over the left motor area. This shaded off below, anteriorly and posteriorly. There was a little purulent meningitis also on the right side. When the brain was removed a considerable amount of pus was found at the base, most of which seemed to have drained to this point; but there was also an exudate about the pons. No thromboses were found in any of the sinuses. The sphenoidal cells were opened and found normal. As the dura was stripped from the remainder of the petrous portion of the left temporal bone a small amount of cheesy material was found in the region of the superior semicircular canal. There was no evidence of direct extension, though it was assumed that the path was through the dura at the point where the operator found a cheesy mass at the first operation—namely, epidural and just above the tegmen antri.

An exudate was noticed over the inner part of both cerebellar lobes, as well as inner aspect of the left occipital lobe. There was considerable hemorrhage in the arachnoid space over the left frontal lobe, extending back over the fissure of Sylvius to the anterior part of the temporosphenoidal lobe. There was also a similar hemorrhage over the outer aspect of the left cerebellar lobe.

No abscess could be found anywhere except a very small superficial one, about the size of a pea, on the under surface of the left temporosphenoidal lobe, which would about correspond to the tegmen antri.

Three germs were isolated from the meningeal pus—*staphylococcus aureus*, a rather large bacillus of the proteus

group, a small Gram negative unidentified bacillus and an occasional colony of streptococcus pyogenes.

Conclusion.—This patient evidently had a purulent meningitis for some time before admission, yet, except for his temperature, which was anything but characteristic, gave no symptoms which we are accustomed to expect in meningitis. Moreover, the cytologic findings did not give us any help. It is true that the presence of blood in the fluid taken at three lumbar punctures made the leucocyte count of practically no value, although Dr. Dixon was inclined to believe that the leucocytosis was out of proportion to the blood admixture, even if the blood did contain 28,000 white cells to the cubic millimeter. The blood also would have caused a positive globulin test, so whether the globulins found present were all from the blood, or partly from the meningitis, no one could have stated. The Fehling's test also failed us, as did the cultures, which were negative in the case of the three spinal fluids.

Another feature was that a process found to be so general should have caused so few symptoms which, except for the prostration and fever, were practically nil until about thirty-six hours before death, when the large purulent accumulation over the motor area gave rise to spasm followed by paresis of the arm and leg.

The escape of gas upon making the initial incision in the radical operation is, to say the least, a rare occurrence, and caused me to suspect that I was dealing with gas bacillus infection, but this I believe was not borne out by the results of culture of the meningeal pus.

Finally, with a sinus in a necrotic condition, filled with a broken down, foul smelling clot, the blood cultures all proved to be negative, and jugular resection seemed to have no influence on the process. One would have expected the meningitis to arise by infection from the sinus, but at autopsy the inner wall was found to be in fairly good condition, although at operation the outer sinus wall was necrotic. Moreover, the meningeal infection appeared at postmortem examination to have extended from the small extradural accumulation of cheesy pus, which was indicated in the X-ray plate and found at operation to exist immediately above the tegmen tympani and antri.

616 Madison Avenue.

LXII.

THE INTRANASAL OPERATION FOR THE RELIEF OF CHRONIC DACRYOCYSTITIS WITH SOME DEDUCTIONS FROM TWENTY CASES.

BY CARL F. BOOKWALTER, M. D.,

No attempt will be made in this brief paper to describe the operation in detail, since it is not a new operation and has been described very well by J. M. West and others. General conclusions cannot be drawn from twenty cases, but some important points may be brought out.

It often has been said that this method gives no better results than those methods having for their object the removal or obliteration of the lachrymal sac. Several ophthalmologists of experience have told me that they invariably get good results by removing the sac. Others of equal skill and experience have said that suppuration is not always stopped by the sac operation and that in many cases tearing is a disagreeable feature. Of course, it might be urged that failure to stop the suppuration is due to poor operating, but tearing frequently follows removal of the sac, even in cases where suppuration has been arrested and the results, except for tearing, are all that could be desired.

Drainage of the lachrymal sac into the nose is not a new idea. Various instruments have been passed through the canaliculi into the sac and then into the nose. Only small openings could be made in this way and such openings soon close. The operation that I have used is essentially that devised by J. M. West. West's first cases were done in the Johns Hopkins Hospital in 1907-1908, but most of his work has been done in Berlin. The object of the intranasal operation is to establish a permanent opening from the nose into the lacrimal sac and nasal duct. Drainage thus obtained relieves the suppuration, and a way is provided for tears to pass into the nose. The opening is made just in front of the anterior end of the middle turbinate and above the inferior turbinate. The upper end of the opening is at the level of or a little above the attachment of

the anterior end of the middle turbinate, the lower end is well down to the inferior turbinate. The width and direction of the opening correspond to the width and direction of the sac and nasal duct.

In exposing the bone to be removed in the operation, it is not necessary to remove any turbinate tissue or to destroy any of the nasal mucous membrane except over the intended opening. After the bone is exposed, enough of the nasal process of the superior maxillary and of the lachrymal bone should be removed to expose the full width of the sac and duct. The opening in the bone should extend nearly to the top of the lacrimal sac and almost down to the inferior turbinate. As soon as any of the sac is exposed, a probe should be passed through the canaliculus into the sac. The nasal side of the sac can then be moved by the probe and a good guide for the operator is established. When the sac is well exposed, a small hook serves best to grasp it and the exposed nasal side of the sac and duct can be cut away with a small knife, leaving the lateral side in place. Small punch forceps set at various angles are very useful to trim off any tags or rough edges of the sac. The openings in the nasal mucous membrane, bone and sac should be of the same size when the operation is complete. The nose is lightly packed for twenty-four hours. The operation is rather difficult to do, and to get a good result the operator must be very careful and painstaking. A little bleeding interferes greatly with the procedure, but with patience this can be controlled. The patient suffers some pain, especially when the sac is reached, but I always have been able to finish the operation under local anesthesia. During the following four to six weeks the patient must be kept under careful observation, and excessive granulations around the opening must be removed. This is an important point, because the opening tends to close or to become partially closed during the healing process. If at the end of six to eight weeks the edges of the opening are firm and smooth, the case may be considered cured.

The twenty cases referred to in this paper include all the cases I have operated upon up to January 1, 1917. I have not included cases done in 1917, because it might be said that no opinion as to the final results could be formed. Naturally the

early cases were not so well done as the later ones. All of these patients were relieved of suppuration at once, and all with whom I have been able to keep in touch have remained free from suppuration. There are several factors entering into the question of tearing. In the first place, the opening into the sac must be kept clear. I have been able to accomplish this in all cases where the opening was made large enough at the time of operation and the patients have been faithful in returning for treatments. Of course, the canaliculi must be open. Many of these cases have had the canaliculi injured by previous treatments, and in such cases the results are not so good as in cases where the canaliculi are in good condition. A slit canaliculus does not work so well as an intact one.

Ten of the twenty cases have remained free from suppuration and tearing for more than a year. Four cases operated upon in the latter part of 1916 are well. Three cannot be traced, but were well when last seen. Three cases complain of tearing at times. In one of these, the opening into the nose was not made large enough, and while it did not close completely the edges of the opening were too close together, and probably the aperture was clogged at times. One case had the lower canaliculus completely closed as a result of previous treatment, and the upper canaliculus was injured also. This case was relieved of suppuration, but there was tearing. The third case with tearing was that of an old lady with drooping lids. The lower canaliculus had been slit and a small opening had been made into the nose. This opening was closed at the time of my operation. Pus was running over the face from a fistula into the sac. The patient was relieved of suppuration, but has tearing at times. One case with a slit lower canaliculus has no tearing unless he holds his head forward for some time.

The case of Miss E. N. is interesting. In 1913 she had the right sac removed, with an excellent result, except that tearing bothered her. In May, 1915, I did the intranasal operation on the left side, which had been suppurating for two years. She was relieved at once and has remained well. The left side does not tear, and she says that she gladly would have the same operation done on the right side if it were possible.

In this case the canaliculi were in good condition and the opening has remained clear.

CONCLUSIONS.

The results of the operation are ideal if the canaliculi are in good condition, the operation well done and after-treatments carefully carried out.

Suppuration is relieved invariably.

Even in cases with defective canaliculi, there is little tearing, and then only at times, or with certain positions of the head.

The opening into the sac must be made large with smooth edges, and the edges must be kept smooth till healing is complete.

104 S. Michigan Ave.

LXIII.

REPORTS OF MASTOID CASES FROM AN X-RAY
STANDPOINT.

BY GEORGE SLOAN DIXON, M. D.,
NEW YORK.

Gentlemen—Your Chairman has done me the honor to ask for the exhibition of some X-ray plates of the mastoid exposed in the course of our work at the New York Eye and Ear Infirmary, and report the X-ray and pathologic findings. It gave me great pleasure to comply.

5837.—Miss E. J., about nineteen years of age, a case of Dr. Dench's. Acute suppurative otitis media, left. The same side had been affected some years previously, and whether the mastoid should be explored depended upon the X-ray findings.

She was examined September 28, 1917. A clear pneumatic mastoid was found on the right side.

The left mastoid was a hazy to cloudy pneumatic, but there was no evidence of breaking down, and it was not cloudy enough to indicate the necessity for operation. So it was reported: "Not operative at present." The case cleared up without operative interference.

5965.—Mr. G. Admitted to the infirmary October 28, 1917, in the service of Dr. Bacon.

This case had been referred to me by an outside surgeon on the 26th of October, and the following report was made:

"Has a very large, clear pneumatic mastoid on the right side. Sinus about the usual position.

"Left side has apparently also been of pneumatic type, but it is thoroughly disorganized. There is no question as to its being an operative case, and think that a large perisinus abscess and probably an epidural will be found."

He gave a history of sea bathing in July; complained of pain in the left ear shortly after, for which he attended a dispensary. There was slight discharge. Swelling appeared behind the ear in the latter part of September. In a few days this swelling subsided, but reappeared last week—that is, the week previous to October 28th. He complained of pain and headache.

The case was operated on October 30th, two days after entering. Pus and granulation tissue were found under the

cortex. He had a perisinus abscess at the knee, and the sinus was covered with granulations. A zygomatic abscess was also present. He is still in the hospital, but doing well.

5721.—L. D., aged twenty-six years, was admitted to the infirmary August 30, 1917, in the service of Dr. Lewis, with a history as follows:

"Four weeks previously he developed an earache on left side, following a swim. He fainted the next day. For five days earache continued, until it began to discharge, and the discharge has continued ever since."

Examination showed the canal filled with foul pus; pouting fit-like granulation protruding from superior portion of membrana tympani; faint, deep tenderness over the antrum.

He was X-rayed on the 28th of August—two days previous to admission.

The right mastoid proved to be a well developed, clear pneumatic, with sinus about as usual.

The left mastoid was also of a pneumatic type, very cloudy throughout; sinus forward at knee, with fairly clear evidence of loss of bone over and just below the knee. Perisinus abscess suspected.

A mastoidectomy was done by Dr. Blackwell on the 30th of August, who reported that he found no free pus. There was a large amount of granulation tissue about the antrum over and above the knee of the sinus, with trebeculae broken down.

There was no free pus in this case, but the fact that the trebeculae over the knee having been found broken down was sufficient to warrant the X-ray reading.

5865.—Mrs. M. E., aged forty-five years. A private case of Dr. Dann's.

Dr. Dann referred the case to me on the 4th of October. I reported both sides as fairly well developed pneumatic mastoids, there being very little difference between them, neither being particularly clear. The right was a trifle hazier than the left, and the septa a little less distinct.

There was a peculiar little area just above the antrum of the left side, which seemed to be in the squama. It was circumscribed, about three-eighths of an inch in diameter, and

gave the impression of a sequestrum; the short duration of the case was against this.

She did not do well, and returned on the 9th for reexamination, when the plate showed that the area above the left antrum had changed its appearance, what seemed to be a sequestrum having been partially absorbed. It was then found to be a case of streptococcus mucosus capsulatus infection, and a diagnosis of probable epidural abscess was made.

Dr. Dann operated the next day and found the bone badly disorganized, with an epidural above, as reported.

5848.—Mr. K., aged forty-two years. A private case of Dr. Lewis. Was admitted to the infirmary on the 1st of October, 1917.

Dr. Lewis informs me that the patient had been complaining for about five weeks before he saw him. There was slight discharge; no tenderness; no temperature, and very few canal symptoms. There was a little drooping of the posterior-superior canal wall, but it was not marked, and there was a tit-like perforation of the membrana tympani. He said that it was a case which he thought might be operative, but he did not care to undertake the operation without evidence which an X-ray examination might supply.

X-ray examination was made on October 1, when it was found that the left was a clear pneumatic bone, with a sclerosed postsinus area and tip.

The right was found to be an exceedingly cloudy and apparently disorganized pneumatic, with sinus well back, and operation was recommended.

Dr. Lewis operated the same day, found the entire bone softened throughout, and the sinus and dura exposed by disease. Patient made a good recovery.

5853.—Miss J. W., aged twenty-nine years. A private case of Dr. Saunders.

Was referred for X-ray examination on October 1st. The right mastoid was found to be fairly well developed and of pneumatic type, the sinus being located about as usual.

The left was a very cloudy, apparently pneumatic bone, with sinus somewhat superficial, but otherwise in about its usual location. The appearance was so unusual that the pa-

tient was asked to return. She did so on the 3rd, and the findings of the former plate were confirmed, and operation suggested.

She was admitted to the infirmary on the 5th of October, and Dr. Saunders operated the same day. The entire mastoid was filled with pus, and most of the cells had necrosed. The pus was under pressure; a perisinus abscess exposed a small area of sinus just below the knee. She made a good recovery.

A smear from the mastoid pus showed that it had been a case of streptococcus mucosus capsulatus infection.

I have little information as to the history of the case, but she was going about, and was apparently in very fair general condition. Dr. Saunders will probably have something to add.

5827.—V. DeL., aged sixty-five years. Was admitted to the infirmary, in the service of Dr. Whiting, with a subperiosteal abscess following a right otitis media purulenta chronica. The infection was streptococcus mucosus capsulatus of six weeks' duration, and of course would have been operated on without an X-ray examination, but it was done in the routine course of our work.

His left mastoid was found to be a pneumatic bone, with a sclerosed-looking lower half, the sinus being about the usual position.

The right—a very cloudy pneumatic; the sinus not shown. A large area of soft bone from the antrum back and below, measuring one inch vertically by one and a half anteroposteriorly.

Diagnosis of epidural and perisinus abscesses made, and operation of course recommended.

A mastoidectomy was done by Dr. Dann on the 24th of September, who stated that he had never seen such extensive destruction, and that the X-ray findings were fully confirmed.

6004.—Mrs. W. F., aged sixty-two years. Service of Dr. Lewis. She presented herself at the infirmary for treatment of her right ear. She had practically no mastoid tenderness. She had what looked like a furuncle on the posterior canal wall, well outward, which obstructed the view of the fundus.

At this time there was no purulent discharge. It was serous. Her hearing on this side was good. She could hear a low whisper at several feet. Shortly after this the discharge became purulent, and she had more tenderness. She could give no correct idea as to the length of time the ear had been involved. She said it was two, three, or four weeks, and she gave no history of marked pain in the ear.

X-ray examination was made on November 3rd. The left mastoid was found to be a clear pneumatic. The right had the appearance of being completely disorganized; sinus in about the usual position.

At the operation the cortex was found fairly thick. There was marked breaking down of the bone throughout, and a perisinus abscess was found.

December 14, 1917.

LXIV.

DENTIGEROUS CYSTS, WITH REPORT OF A CASE.

BY IRA FRANK, M. D.,

CHICAGO.

Before proceeding to the history of the patient, allow me briefly to state certain facts regarding cysts of the jaws. Maxillary and mandibular cysts have long been known and were recognized by ancient medical writers, but it was not until the first quarter of the nineteenth century that records show an attempt to differentiate the various types of hollow jaw tumors, and any serious effort to account for them etiologically. Magintot, in 1872, was the first to attribute cysts of the jaw to embryonic rests of dental tissue. In 1885 Malessez, in France, published his theory of the development of dental cysts: and further study by numerous observers and students has added little or nothing to his contribution. According to the Malessez theory, cystic odontomas arise from a small irregular cell mass about the roots of the teeth, called by him "débris épithéliaux paradentaires." This débris, which is the remains of the embryonic dental ridge, the epithelial cord, and the outer layer of the enamel organ, is found in the jaws of adults throughout life.

Probably the simplest classification of cystic odontomas is that recently suggested by New, of Rochester. I have been prejudiced in favor of this classification for the simple reason that it establishes a direct simple nomenclature, which is something no two previous writers seem to agree on. New recognizes two classes of cysts, namely: (1) Simple cysts, and (2) adamantinomas. The first or simple group consists of dental or root cysts, and secondly, dentigerous cysts. The second group contains the enamel odontomas and the malignant multilocular cystic tumors.

The simple dental cyst is the most common of the cystic odontomas, and arises from the paradental débris through abnormal irritation or stimulation. The irritation may be the eruption of a tooth or some form of peridental inflammation, such as alveolar abscess or the dead root of unfilled teeth

They may, therefore, occur at any age, and cases reported show an age range from early childhood to seventy years. The tumor is said to vary from the size of a cherry to that of a small orange. They do occur much larger; and to continue in the vegetable system of measurement, Brophy records a cyst as large as a fair sized cantaloupe.

The walls of the cavity are composed from within outward of thin flattened epithelial cells and a layer of connective tissue and bone which varies in thickness according to the size of the cysts. When large, the growth erodes the surrounding bone, which gradually thins and separates into fragments to form the so-called eggshell crackling as a clinical symptom. The contents of the cavity are a thin white or yellow fluid, sometimes mucoid in character, with broken down epithelial cells and cholesterine crystals floating in it.

The dentigerous or tooth bearing cysts are believed to arise from the *Malessez debris* most generally, though Bland-Sutton is of the opinion (and Brophy coincides with this) that they are formed from the epithelium which dips down into the sub-mucous tissue to form the enamel organs; in other words, an expanded dental follicle. These cysts occur less commonly than the simple dental cysts, and are usually located in the bicuspid or molar region in either jaw. They form and grow principally during or shortly after second dentition and therefore occur early, except when they appear in association with the eruption of the third molar or wisdom teeth. They may, however, not be noticed until late in life.

Characteristic of this type is the absence of a tooth corresponding to the position of the growth, and, possibly, an irregularity in the two teeth adjoining the vacant space. The swelling may grow to great size as in the simple dental cysts, and limit the motion of the jaws. It may extend outward hideously to distort the face, or, in the superior maxilla, erode into the antrum. The cyst wall is similar to that of the dental cyst, but the contents differ in that the missing tooth is found imbedded quite loosely in the substance of the wall. This tooth, and more rarely the remnants of a number of malformed teeth, are seldom developed—especially is this true of the roots.

The following history and findings, the diagnosis of which was a simple matter with the use of the X-ray, is fairly typi-

cal, differing only from the general run of recorded cases in minor details.

The history of the case is briefly as follows: Male, twelve and one-half years of age. When six years of age parents noticed a swelling in upper jaw just beneath the nasolabial fold on the left side. The growth has at no time been painful and has increased in size very slowly until at the time of observation it was about the size of a small plum. The lateral incisor, cuspid, and bicuspid teeth on the same side were missing and have never erupted. The mucous membrane appeared normal, no glandular enlargement was present and palpation elicited a parchment-like crepitation.

Nasal examination negative. A roentgenogram demonstrated the true character of the tumor, showing distinctly a cyst with the three missing teeth present (Figure 1). At the time of operation the tumor had assumed such proportions as to entirely fill the cavity of the antrum of Highmore. It was removed by making an incision on the buccal surface of the superior maxilla similar to that employed in performing the radical antrum operation. After exposing the mass it was incised, allowing the escape of fluid and revealing the location of the teeth, which were firmly imbedded in the alveolar process. The cyst (Figure 2) was easily shelled out, after which the wound was closed with the exception of a small drain. Recovery uneventful.

Pathologic Report.—The cyst measures three by three by two centimeters. Outer wall is whitish and smooth. The inner surface is pink in color. The wall is three millimeters thick. There are three rather small but well formed teeth.

Microscopic Description.—The wall of the cyst is formed by dense fibrous tissue, many of the bundles of which are homogenous and hyalin. Many small, vacuole-like spaces, apparently due to edema, are present. The tissue contains moderate numbers of thick walled blood vessels, the walls of which are markedly hyalin. Wide, thin walled blood vessels, lined by prominent endothelium, are somewhat more numerous. Scattered diffusely throughout the dense tissue of the outer half of the wall are moderate numbers of lymphocytes; about some of the blood vessels these are grouped to form dense foci. In the inner half of the wall the lymphocytic infiltra-

tion, diffuse as well as perivascular, is very much greater. The inner surface of the cyst is lined by a layer of squamous epithelium, of about the same thickness as that of the normal buccal mucosa. The epithelium lies upon a row of short, regular papillae, from which the epithelium is very sharply defined. The thin walled vessels of the papillae are distended with blood. The epithelium is richly infiltrated with polymorphonuclear leucocytes, smaller numbers of which are intermingled with the lymphocytes present in the stroma of the papillary layer.

Diagnosis.—Dentigerous cyst, with acute and subacute inflammation.

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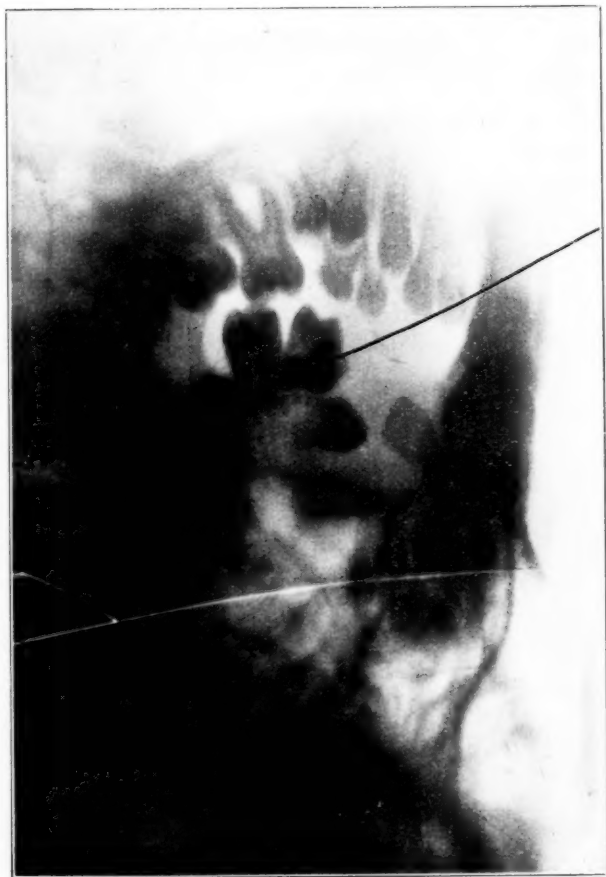


Figure 1.—(Imperfection due to crack in plate.)



Figure 2.—(About seven-tenths actual size.)

CLINICAL OBSERVATIONS ON SUBACUTE
MASTOIDITIS.

By HUGH B. BLACKWELL, M. D.,

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The expression, subacute inflammation, as applied to the mastoid, is here used in its broadest sense. It is meant to indicate that period of mastoid inflammation which follows immediately on the disappearance of all acute inflammatory phenomena, and its duration extends until the patient has made a complete recovery from the original infection or a chronic suppuration has been established.

The term "resolving mastoiditis" is often applied to this condition, but its use would suggest that the patient was improving. For this reason, the author believes that the appellation is misleading, carelessly applied, and its use is often based on a limited appreciation of the potential gravity of these cases.

Duration.—The acute period of mastoiditis might be said to cover anywhere from a few days to a week or more. As the acute bone tenderness disappears, earache and throbbing cease, the temperature falls, and the condition might be said to become subacute, without the quantity or quality of the aural discharge having undergone any alteration. A subacute inflammation having existed from two to three months, it arbitrarily becomes one of chronic suppuration.

Pain.—Objective pain, such as mastoid tenderness, is not a very conspicuous symptom in subacute mastoiditis. In fact, it is usually conspicuous by its absence or by being noted only in deep pressure. Generally speaking, the longer the

duration of these cases, the less evident is the bone tenderness. This should not surprise us when we consider the continuous structure of all mastoid cells with each other and the middle ear. During subacute inflammation this anatomic condition easily permits the establishment of free drainage from the mastoid cells, thus relieving the tension and incidentally the pain. Furthermore, these structural characteristics render it possible for a mastoid to undergo marked degeneration during the subacute stage, and yet present but little or no pressure tenderness.

Subjective pain is a variable factor. Headache is much more constantly present than during the acute stage. It is chiefly nocturnal and usually intermittent. Discharge is the least constant factor in subacute mastoiditis. It may be most profuse in quantity, of heavy thick consistency, appearing through a drum perforation in a pulsating manner. On the other hand, it may be entirely absent, or it may exist as a thin, scanty, mucous or serous exudate.

Audition.—The impairment of aural function is subject to wide differences, but usually in cases requiring operation the hearing in the affected ear is very much lowered.

External Auditory Canal.—Fundus changes in the canal may show the greatest variations. The drum may present all the evidences of a severe mastoid suppuration, or, on the other hand, it may appear to the uninitiated almost normal. Between these two extreme pictures there may be present almost any degree of inflammatory reaction.

The cause of premature middle ear resolution in subacute mastoiditis is the formation of a thick plug of organized granulation tissue in the antrum, which tightly seals it and completely separates the middle ear from the mastoid, thus permitting the middle ear to assume a more or less normal appearance and allowing the mastoid suppuration to continue undrained until it either ruptures spontaneously again into the tympanum and reestablishes the aural discharge or terminates in the solution of a table of the skull, or a spontaneous cure.

I have had numerous cases of this sort. On opening the mastoid the cells may be found to be extensively diseased; but the antrum, instead of being broken down and represented by a space filled with pus and loose granulations freely com-

municating with the mastoid, is found to be dry and tightly filled with this thick plug of organized tissue. The development of this condition is of course favored by the small size of the antrum with its thick bony walls, and probably accounts for the large number of cases that are reported with normal drums associated with suppurative mastoids. I have never seen one of these cases where the drum was absolutely normal. They always had some appearance of semiresolution, and the patients have always had some subjective disturbance. For this reason, I wish to emphasize the importance of recognizing and appreciating the value of all clinical appearances, however slight.

There is still another condition that I have noted, namely, where the inflammation presents or ruptures in the posterior bony canal wall, giving all the appearance of a furuncle of the posterior wall of the external auditory canal. In several of these conditions the furuncular swelling has departed from the usual type in that it was cone-shaped, coming to a point and sloping away evenly in every direction. From the apex of the swelling the pus discharged drop by drop. Behind this appearance could be seen a resolved drum. At the operation, on lifting the membranous from the bony wall just underneath the swelling, there was found a mass of granulations protruding evenly from a small round bony cortical perforation, which elevated the overlying membranous wall and produced the condition.

Operative Indications.—One naturally hesitates to speak at length on this point to an audience so thoroughly versed on this subject, but since many cases of this class vary widely in their clinical appearances from each other and from the orthodox, well established and framed picture of acute mastoiditis with clear operative indications, a few words on this phase of subacute mastoiditis may be well taken.

A situation that frequently confronts an otologist in the treatment of mastoiditis is as follows: The acute stage having passed, the discharge having become much reduced or perhaps entirely ceased, mastoid tenderness almost or entirely gone, and the earache disappeared, one would naturally regard the case as much better were it not for the fact that the tongue is still coated, bad breath present and some nocturnal headache

continuing. The patient and his friends are inclined to regard his condition as much improved, and it is frequently somewhat of a shock for them to realize that this feeling is not shared by the otologist. Under these circumstances, their questions are a source of embarrassment to the physician, who puts off from day to day the giving of a definite expression of opinion, during which time he is looking and hoping for a marked local change in the patient's condition that would either render an operation imperative or point the way to a spontaneous cure. Should the mastoid happen to be well broken down, an X-ray would be of great assistance in definitely clearing up the question of the necessity for an operation. Unfortunately, however, there are many of these cases in which there is only a slight pathologic change in the bone of the mastoid. This change is not sufficient to register definite signs of bone destruction, so that a plate of such cases would show a mastoid apparently only slightly diseased, or almost normal. These mastoids, while innocent from an X-ray standpoint, are capable of producing the gravest intracranial complications. Accordingly, we are thrown back to a consideration of the clinical evidence presented in determining the necessity for an operation.

Now the question is, What clinical evidence should cause us to advise an operation where the results of the X-ray examination are more or less negative, the canal being dry or almost so, with a drum of resolving appearance, and little or no mastoid tenderness present? Briefly, it is as follows:

1. History.—A history of four weeks' duration; nocturnal pain or restlessness; queer feeling in the head; any slight temperature not attributable to other causes; deep bone tenderness only determined by comparison with the normal side, and lastly, but most important, evidence of general toxic absorption, as shown by coated tongue, bad breath, headache and lassitude.

It has been my own observation that when an operation is really indicated these patients generally sense the gravity of their own condition and readily assent to any suggestion in favor of mastoidectomy. Some who subsequently develop meningitis seem to be stimulated to intermittent spells of great activity, probably caused by early cortical irritation. I have

had one such patient. We must remember that all streptococcus infections are more serious than other forms. I have had a number of capsulatus infections recover without operation.

Finally, in regard to the value of the X-ray as a diagnostic aid in determining the necessity for an operation, I wish to say that I believe it to be of great assistance when the plates are taken by one so thoroughly versed in the subject as Dr. Dixon. However, the findings must always be weighed in conjunction with the clinical evidence, which, after all, is our main dependence in reaching a definite conclusion.

148 West Fifty-eighth Street.

LXVI.

NOTES ON CASE OF MENINGITIS OF OTITIC
ORIGIN.*

BY DR. ALFRED KAHN, M. D.,

NEW YORK.

On July 23, 1917, Mr. A. N., twenty years of age, presented himself at the New York Eye and Ear Infirmary on the service of Dr. Dench. He complained of headache, which he localized over the right side of the head, having had this headache off and on for a period of several weeks. He had felt dizzy for about the same period of time at intervals. His general condition was good; temperature 99° . The fundus of his right ear showed quiescent otitis media purulenta chronica. There were no signs of an acute process. He stated that he had had a discharging ear off and on for a period of about four years. At the time of examination, the external canal did not contain any discharge. He did not have spontaneous nystagmus. The static labyrinth tests were normal. On account of his dizziness and headache, he was admitted to the ward for observation, with a diagnosis of possible cerebellar abscess. His condition remained unchanged from date of admission, his temperature ranging between 99° and $101\frac{1}{2}^{\circ}$, until July 29, when he suddenly developed a rapid rise of temperature to 106° , with very slight mastoid tenderness. A diagnosis was then made of episinial abscess with possible jugular involvement. The mastoid was opened, an epidural abscess, with clot in the sinus, found. A radical mastoid operation, with removal of internal jugular vein, was performed. July 30th, the next day, his temperature was down to 100° ; his temperature curve gradually dropping, ranging between $98\frac{1}{2}^{\circ}$ and $100\frac{1}{2}^{\circ}$, until on August 4th, about seven days after the first operation, his temperature again suddenly rose to 104° . The

*Read before the New York Academy of Medicine, Section on Otology, December 14, 1917.

patient became delirious and showed symptoms of meningitis. He was taken to the operating room, the mastoid wound explored, a large area of dura exposed—but the dura was not incised. (It is my opinion that if it had been incised the patient would have died.) The sinus was again opened and allowed to bleed freely from above. The lower end, of course, was tied off at the first operation. I believe that it was this procedure of freely bleeding, thereby lowering intercranial pressure, that caused a cure in this case, and it is further my belief that it is a valuable suggestion in the treatment of meningitis of otitic origin. It seems superior to exposing the subdural space in the presence of a meningeal infection for the purpose of decompression. After the second operation the patient's temperature rapidly dropped to 100° , gradually vibrating to normal, until, on August 31st, he was discharged cured.

Considering the case more in detail, his recovery would seem to be due, first, to the prompt radical mastoid and jugular operation, and, in the second operation, to the bleeding when the lateral sinus was opened, and to frequent lumbar punctures. In this connection it occurs that the procedure of opening the lateral sinus for the relief of brain tension in meningitis is a good one. This may especially be true in those cases where the meninges are infected by way of the internal ear. It is a known fact that pressure made over an exposed lateral sinus will indirectly increase the rise of endolymph in the modiolus. If the modiolus is broken, pressure of the sinus will increase the escape of endolymph. It is also known that pressure over the cerebellum will increase the irritability of the labyrinth. This is probably due to increased tension indirectly on the endolymph in the semicircular canals.

Having this experiment in view, it occurs, as a matter of fact that, conversely, by opening the lateral sinus and bleeding directly from the brain tissue, brain tension will be reduced. For this reason, it would seem that the recovery of this man might be due to the fact that the lateral sinus was freely bled. Along the same line, spinal punctures probably also aided in keeping his brain tension low. This procedure has been mentioned in the literature on this subject before, especially by Dr. Dench in a paper read before the International Medical Congress in Buda-Pest several years ago.

Considering the case further, it is of interest apparently at first from the lack of diagnostic symptoms. There was no mastoid tenderness, no bulging of the external auditory canal. The fundus did not show any active process. It was quiescent. On account of his severe headache and dizziness, he was admitted as a case of possible cerebellar abscess. The first operating indication was the rapid rise in temperature, accompanied by chill, with loss of consciousness. A diagnosis of episternal abscess with possible jugular involvement was then promptly made, and on opening, such was found to be the case. Following the operation there was an immediate subsidence of symptoms and returned consciousness, followed in one week by meningitis, after the patient was apparently well on the road to recovery.

BLOOD SIGNS AND LABORATORY FINDINGS.

The laboratory findings (blood, spinal fluid, etc.) and readings are of such marked interest that the case would be incomplete without reporting them. On July 25th, four days before first operation, the blood showed 15,000 white cells, of which 57.8 per cent were polymorphonuclear leucocytes. On August 4th, ten days later and six days after the first operation, the blood showed an increase of polys to 92 per cent; the question might arise was this increase of polys due to infection of the sinus between the torcular and the mastoid opening, or was it due to meningitis? On that day, blood culture, after seventeen hours, was negative; but on the same date the spinal fluid contained cells equal to pus. This is indicative and is diagnostic of meningitis. On August 6th, two days following the second operation, the spinal fluid was less turbid, and the white cells were reduced from an uncountable pus equality to a cell count of 2,480. The globulins were reduced from a count of four plus to two plus. Fehlings was negative. Culture was negative. On this date the temperature was dropping and the patient returning to a normal state, showing that the second operation was exactly at the turning point towards recovery.

Finally, in closing this report, let me state that I do not know of any case in the literature of meningitis where there was a spinal fluid cell report equal to pus and where the patient lived.

50 East 42d St.

LXVII.

CHANGING METHODS AND ADVANCES IN THE
TREATMENT OF PROGRESSIVE DEAFNESS
FROM CHRONIC SECRETORY OTITIS
MEDIA.*

BY FRANCIS P. EMERSON, M. D.,

BOSTON.

For the reason that otology is not an exact science, there are problems connected with its practice that should be reconsidered at stated intervals. One of these is the diagnosis, prognosis and treatment of that form of progressive deafness which is the result of chronic secretory otitis media.

Previous papers on this subject were read before this society by Dench in 1894, Harris in 1908, and by Holmes in 1912. These three papers are the only ones of record, with the exception of Reik's paper on the relation of the tonsils to middle ear deafness.

The discovery of lymphoid hypertrophy in the vault of the pharynx, and the recognition of its relation to the eustachian tube by Wilhelm Meyer, marked an epoch in the prevention and treatment of this form of middle ear disease. This was fifty years ago. Following this discovery, the further appreciation of the close relationship of the nasopharynx to the middle ear made the organization of this society a logical step. A large proportion of its present membership were educated first as otologists, and they have since studied and treated the nasopharynx only so far as in their judgment such treatment, operative or nonoperative, could influence the prognosis of progressive middle ear disease.

In consulting the files of this society, we find frequent reference made to the necessity of stopping infection by way of the eustachian tube. Hardly a writer, with the exceptions

*Read before the American Laryngological, Rhinological and Otolological Society, Atlantic City, May 31, 1917.

noted, has ventured to clearly define what he considered to be indicated along this line. The teaching in our universities makes no attempt to correlate the two subjects of rhinology and otology in such a way that the student should know what to do, and what not to do rhinologically, to influence the middle ear. Each student is left to work out his own clinical experience, beyond instruction which relates specifically to the vault of the pharynx. Observation among the leading otologists of today would lead us to infer that we are divided into two classes in our efforts to protect the middle ear. In the first class are those whose treatment is almost wholly confined to the nasopharynx and Rosenmüller's fossæ, to such an extent that it is common practice for their patients to consult them as aurists, and their confreres, as rhinologists. In the second class are those who correct all deformities of the septum, abnormal conditions of the turbinates, drain the sinuses, remove tonsils, etc., and in fact do what any rhinologist would do, and believe that in so doing they retard or check the progress of middle ear disease.

The writers of our latest textbooks give very scanty reference to remote foci, in discussing the etiology of chronic secretory otitis media.

In order that the writer might not misconstrue the attitude of the first group, namely, those who lay especial emphasis on the nasopharynx, he sent the following question to fifteen prominent aurists:

"Given a case of progressive deafness as the result of chronic secretory otitis media, where the hearing for the whispered voice has been reduced to 15/25ths, or less, would you expect any improvement from treatment of the nasopharynx, excluding the epipharynx and inflation?"

Replies were received from ten, all of whom said they would not expect any benefit, provided the lymphoid tissue in the vault and fossæ had been thoroughly removed. One considered such a case as a beginning otosclerosis, and one had seen active operative measures do harm. In order to prove that positive improvement in hearing results from the cure of remote foci is not an easy problem, as the testimony of the patient or of the aurist is of no scientific value, unless such observations are supported by careful hearing tests and records

covering a term of years, for we are dealing with a chronic disease which is subject to acute exacerbations and varying acuity of hearing.

Further, in order that such records should be available for analysis, such observations should extend over a period of from three to five years.

It would seem appropriate, after this length of time, to consider again whether we have made any advance in the treatment of chronic deafness over the pioneer work of Meyer and Toynbee fifty years ago. Their work has since been elaborated by Politzer, Lucae, Siebenmann and others, but the essential facts are unchanged. Can we today offer any more hope to this unfortunate class of patients who comprise such a large part of our clientele? If some of them can be helped, is it possible to predict as a result of examination, that good results will follow our treatment in a given case, and how far any lost hearing may be restored?

In order that we may discuss this subject from common premises, let us define what we mean by chronic secretory otitis media. In a given case, otoscopic examination would show a dull gray or ground glass appearance of the membrana tympani, absence of the light reflex, and retraction. The clinical picture would be one of slowly progressive loss of hearing, usually more advanced in one ear, with or without tinnitus. The hearing test would show a positive Rinne, the Weber lateralizing toward the more deaf ear. The low note by the Dench fork is unchanged, or slightly raised. The bone conduction is unchanged. The whispered voice, however, may be reduced to as low as 2 to 15/25ths. Given such a case, what conditions, if any, outside of the treatment of the epipharynx, will influence its slowly progressive course? Whether any of the lost hearing can be restored is of the greatest importance to the patient, for the restoration of one or two notes in the upper register will determine to a marked degree the efficiency of the individual.

In order that we may definitely promise ourselves or the patient that the hearing will improve, the writer is guided by the following considerations, all of which depend on the question of reinfection.

It is his experience that in every case of progressive deaf-

ness from chronic secretory otitis media, there is a primary focus which is constant for that individual. This may become quiescent, but in the interval it remains as a low grade process, subject to acute exacerbations. This point I wish to emphasize, for until the primary focus is drained and cured, such acute exacerbations are a constant menace to the eustachian tube and middle ear. The course of the disease will be from bad to worse, and a little more rapidly if inflation is practiced as a routine.

That there are pathogenic bacteria in the mouth and pharynx at all times is common knowledge. That they possess sufficient virulency under favorable conditions to cause serious pathologic conditions in remote organs has been proven by the investigations of Miller, William Hunter, Billings and many other observers.

Depending upon the organism and the virulency of the infection, the clinical picture is one of toxemia, septicemia or pyemia running an acute or chronic course. While this work is of recent date, all such facts had been observed years ago by Professor Arkovy of Budapest, from 1878 to 1898, substantiated by the painstaking microscopic findings of Miller of Berlin, from 1884 to 1894, and by the clinical experience of William Hunter of London, who published his results in the Practitioner in 1900. Miller, who was educated as a physician and also as a dentist, showed bacteriologically that focal processes in the teeth, tonsils, or sinuses kept up a low grade of infection of the adjacent tissues, and during exacerbations this might extend by continuity, or directly by way of the lymphatics or blood stream, to neighboring or remote organs. That such low grade infection is constantly present, either in the nasopharynx or quite as often at some other point in all cases of progressive chronic secretory otitis media, has been the observation of the writer for many years.

In order to determine where this primary focus may be, we inquire of the patient, in taking the history, where these acute exacerbations begin. It is a well known clinical fact that patients subject to acute infections almost invariably claim that for years such infections commenced in a certain manner—i. e., as a sore throat, and then went up or down, or started as a head cold, and then went down.

In a given individual this onset is almost constant, and does not usually alternate over many years, and indicates that the primary focus does not entirely subside, but becomes quiescent and is subject to acute exacerbations whenever the resistance of the host becomes lowered. This, then, gives us our first clue as to where we shall begin our treatment, and cannot be determined by the anatomic conditions of the nares, even if a rhinitis be present. The next question is to ascertain if the hearing varies—i. e., whether it is better on some days than others. In such cases an active cause of the otitis is still present outside of the middle ear, and we can usually hope for improvement up to their best hearing, or more, if we remove the original focus and clear up the accompanying infection.

Let us suppose a case where the history points to the acute exacerbations being more or less constant in the nose. It is the writer's opinion that no amount of anatomic deformity of the septum influences the course of chronic secretory otitis media until after infection takes place, but that such deformity predisposes to infection.

The tendency to a low grade infection in the nares is promoted by the following conditions: Given asymmetrical nares from deviation of the septum, there results a compensatory hypertrophy of the turbinate on the concave side from overfunction from nature's attempt to equalize the air current. As a result, the soft tissue goes through the various phases of congestion, increased connective tissue and thickening of the mucosa. At this stage any acute infection on account of defective drainage may be continued as a low grade process subject to acute exacerbations. With the defective drainage, if a new infection is virulent enough, the sinuses may become involved. We therefore operate in the nares, not to remove a mechanical obstruction per se, but to improve drainage and clear up the attending infection.

To one who accepts this pathology it is essential to the integrity of the tube and middle ear that the infections of the nasopharynx should be cured so that acute exacerbations may be prevented. This can only be accomplished by improving the defective drainage and equalizing the air pressure by reconstruction of the nasal chambers—i. e., straightening de-

flected septa, removing redundant tissue from the turbinates, reducing posterior hypertrophies, and opening all infected cells.

After this it is equally important in cases of deafness of long standing that no low grade process persists, as a nasopharyngitis, or some focus be left that may still be subject to acute exacerbations, and thus offset the effect of our operative procedures as far as improvement of the eustachian tube is concerned. The middle ear condition grows progressively worse by reason of reinfection from the same primary cause, or from secondary foci, until the hearing is beyond improvement. For this reason auditory reeducation, by whatever means, inflation, electricity, etc., that does not take into account the underlying cause cannot be of permanent value until such focus is removed.

Pharynx.—In the pharynx all lymphoid tissue, however small, should be removed, including bands between the eustachian tube and the pharynx, and degenerate tissue in Rosenmüller's fossæ. Where posterior rhinoscopy shows chronic congestion of the lateral pharyngeal wall, the condition of the fossæ cannot be determined without a digital examination. Chronic pharyngitis indicated by a glazed appearance of the posterior wall, and a change in the secretions, the writer has always found to be due to caries in the sphenoid, either alone or in connection with a pyogenic focus in the posterior ethmoids, and the so-called pharyngitis sicca he has not found to exist as an entity. While the diagnosis cannot be made with an ordinary probe, it usually can be made by using one whose shank is no longer than a knitting needle and that has a fused head on the end.

Tonsils.—The tonsils in their relation to local and systemic disease are only beginning to be appreciated, especially when found in adults between thirty and sixty years of age. As we now understand their pathology they account for many of the diseases that were supposed to be constitutional, such as scrofula, rheumatism, autointoxication, etc. Visual examination is useless. The anterior pillar should be pulled forward, and pressure used between the outer wall and the tonsil. In many cases where the tonsil is an active cause of the deafness, free pus will be demonstrated on one side, usually at the

junction of the velar lobe and the middle third of the tonsil, particularly in those cases showing toxemia. This is an enclosed abscess of streptococcus origin and subject to repeated acute exacerbations. The toxemia is marked, and it is probably the cause of chronic nerve degeneration in the labyrinth. Such cases are attended constantly by a low grade pharyngitis. Reik, in his article published in 1908 on degenerate tonsils and middle ear deafness, has fully described their relation to the eustachian tube.

In the writer's experience the extension to the eustachian tube is more often by continuity and through the lymphatics and blood stream along the posterior pillar. The resulting low grade process can be seen not only on the lateral wall, but in the epipharynx and over the surface of the posterior nares, as well as in the mouth of the tube.

Eustachian Tube.—The pathologic processes of the tube in its relation to middle ear deafness, the writer has usually found either at the isthmus or the pharyngeal end. Examination shows the tube, if the process has existed long enough to affect its lumen, as it usually has in chronic cases, more widely open on the side of the most affected ear, hence inflation is not only contraindicated, except for diagnostic purposes, but it makes the loss of hearing more rapid. Indeed, after stopping the infection, one of the next steps in our treatment is to try to restore the lost tone of the pharyngeal end by applications within the tube and by exercises that shall strengthen the function of the palatine muscles. The most experienced aurist will be deceived as to the lumen of the tube by auscultation, as very many cases have a decided narrowing at the isthmus when inflation seems clear. If no mechanical obstruction exists at either end of the tube, nature has provided for sufficient ventilation of the middle ear. If such obstruction does exist in chronic cases, inflation will do no good and will add to the gradually diminishing function of the tubal muscle. Applications within the tube are of great benefit, but they should not be repeated too often, or be strong enough to excite too much reaction. This reaction, where the obstruction has been at the isthmus, has been one of the most difficult things for the writer to control in the treatment of the tube.

The Alveolar Process.—The best work on the pathology of the alveolar process has been done by dentists. The relation of such foci to local and systemic disease has been repeatedly called to your attention by Dr. Haskin. Miller of Berlin, in 1894, showed the seriousness to a patient with low resistance from pulpitis, gangrene of the pulp, pericementitis, alveolar abscess, otitis, osteomyelitis, periostitis, alveolar necrosis and pyorrhea. He called attention to the fact that pyogenic organisms associated with osseous necrosis were very virulent and that the soft tissues over a considerable area showed infection. His bacteriologic findings proved that such local foci might not only involve adjacent tissue, but extend by continuity to the tonsils and pharynx, or through the lymphatics or blood stream to distant organs. For our purposes such diseased conditions should be investigated in conjunction with a dentist, and all devitalized teeth subjected to an X-ray examination, as part of our routine examination in locating foci that may be the cause of a progressive chronic secretory otitis media.

It is often asked why, if such causes are active in the etiology of chronic secretory otitis media, it is not easy to settle the question by producing a series of cases corroborated by hearing tests. The answer is because of the fact that such foci are usually multiple, and few men have systematically attempted to remove all sources of reinfection. Our knowledge of how to drain all the sinuses, of the menace of pyogenic foci in the tonsils and the alveolar process, is too recent to enable us to tabulate a long series of chronic cases successfully treated. The improvement is necessarily slow and extends over a considerable time. With energetic early treatment there is a more hopeful outlook for this field of otology.

As a line of investigation to be further developed, the writer sees no reason why such active foci as are constantly found in the teeth, tonsils and sinuses should not contain bacteria with selective characteristics—i. e., in some we would have our pathology in the mucous membrane, in others the connective tissue, and in still others the osseous structure.

CASE HISTORIES.

Sinuses. (Focus.)

December 2, 1911. J. F. W., born in New Hampshire, aged fifty-one years, single, provision broker.

Past History.—Measles at twenty-one years of age. Rheumatism three years. Tobacco moderately, no alcohol. Neisser infection. Repeated head colds. Teeth all removed. General health good, except for history of gall stones.

Hearing.—Not normal for ten years. Worse for past eighteen months. Sounds confusing. Sharp pain in both ears. Tinnitus. No history of aural discharge. Acute infections start in the head.

Examination.—Both drums thickened. Light reflex gone, retracted. Pus in middle fossa of both nasal cavities. Adenoid tissue central in the vault. Both eustachian tubes open, the right being more open than the left.

Diagnosis.—Chronic secretory otitis media and suppurative ethmoiditis, both sides. Repeated reinfections from a pyogenic focus in the ethmoid sinuses.

Treatment.—Exenteration of both ethmoid labyrinths. Argyrol, twenty per cent, to eustachian tube. Inferior turbinates trimmed. Nasopharynx cleansed with normal salt and sprayed with argyrol, twenty per cent, until infection cleared up. No inflation except for diagnosis.

Hearing Tests.—

December 2, 1911			March 15, 1913			March 13, 1915		
R.		L.	R.		L.	R.		L.
2/25	W	16/25	15/25	W	17/25	12/25	W	N
2/35	acu.	9/35	32	D	32	30"/10"	R	35"/13"
30"/10"	R	35"/13"	(L. L.)				W	
32	+ W	32				32	D	32
	D					(L. L.)		
(L. L.)								
May 13, 1916			January 20, 1917					
R.		L.	R.		L.			
N	W	N	N	W	N			
32	D	32	35"/10"	R	45"/10"			
(L. L.)				W				
			32	D	32			
			(L. L.)					

Result.—No colds for a year. No tinnitus. Hearing normal.

CASE HISTORIES.

Tonsil. (Focus).

May 20, 1915. Mrs. H., born in Rhode Island, aged fifty-nine years, married, no children.

Past History.—Scarlet fever and typhoid at twenty-nine years of age. Pneumonia eighteen months ago. La grippe

several times, but not severely until 1915. Tonsillitis annually for several years. Acute infections start in the throat. No aural history until five years ago, when the hearing became impaired, beginning in the right ear. Occasional tinnitus. No climatic variations. Slight catarrh. Pyrosis. Ears worse after each throat irritation. Is below weight. Nose red, color poor, and has been a semiinvalid for twenty years. Never rugged. Prominent otologist told her that nothing could be done, and instructed her maid how to inflate the ears daily.

Examination.—Both drums show ground glass appearance, dull, lusterless. Left nares, anterior deviation of septum, so that applicator cannot be passed. Contact with inferior turbinate. Middle meatus not injected and no infection present. Septum, sigmoid deflection. Sinuses transilluminate normally; epipharynx negative. Pharynx, low grade pharyngitis. Tonsils, cryptic tonsillar disease. Right, free pus (one or two drops).

Diagnosis.—Chronic secretory otitis media, both sides. Cryptic tonsillar disease. Left anterior deviation of septum. Progressive deafness secondary to tonsillar infection.

Treatment.—Removal of tonsils, and after-treatment until infection was gone. June 2nd, operation, Des Brisay Hospital. Complete tonsil enucleation.

Hearing Tests.—

May 20, 1915				October 18, 1915				December 10, 1915			
R.		L.		R.		L.		R.		L.	
6/25	W	6/25		4/25	W	20/25		9/25	W	20/25	
20"/10"	R	32"/15"		20"/7"	R	25"/11"		30"/15"	R	22"/12"	
	512F			32	D	32		32	D	32	
	W										
32	D	32		January 11, 1916							
				R.		L.					
				10/25	W		N				
				32	D	32					

Result.—Pyrosis gone, weight increased. The right ear, which was the first involved, gained four feet. The left is normal. No inflation.

CASE HISTORIES.

Tonsils. (Focus).

June 4, 1916. Mrs. A. L. M., born in Massachusetts, aged sixty-six years, widow.

Past History.—No history of aural discharges or otalgia in early life. Hearing has been growing worse for ten years.

Family History.—Patient has two children living. Husband died twenty-one years ago, cause unknown (suicide). One brother and one sister living and in good health. No family history of deafness. Father died aged sixty years, cause unknown. Mother died aged eighty years, cause unknown.

Patient has had some ear trouble for the past ten years, which has slowly been getting worse. Hearing varies and is worse when she is tired or has a cold. History of head colds and sore throats once or twice a year. Ringing tinnitus occasionally. Sensation of stopping of ears. History of rheumatism. Left hand shows swollen joint. Used to wake with a headache. Left tonsil shows cryptic disease. Pulsation in ears since sickness three years ago.

Examination.—Chronic secretory otitis media, both sides. Right tympanic membrane, indrawn and dull. Light reflex gone; no marked thickening. Right tympanic membrane indrawn and lusterless. Light reflex gone. Both tubes open, but the right a little the more. Isthmus not narrowed.

Treatment.—Left tonsillar infection cured by operation. No inflation at any time except for diagnosis. Local applications to tubes. Multiple and slow sinusoidal currents used for five minutes in each ear weekly. Current caused vertigo and nausea at first.

Hearing Tests.—

June 4, 1916				December 15, 1916				February 8, 1917			
R.		L.		R.		L.		R.		L.	
1/25	Whisp.	2/25		3/25	Whisp.	3 1/2/25		8/25	Whisp.	8/25	
10"/7"	R	10"/5"						N.	U. L.	N.	
	256c							32	L. L.	32	
April 2, 1917											
R.				R.		L.					
10/25	Whisp.	9/25		13"/7"	R	13"/6"					
					Whisper						
64	L. L.	64			U. L.	N.					
1/10th	U. L.	N			L. L.	32					

Result.—Patient was gaining the most when she stopped treatment on account of the difficulty of coming into town at her age.

CONCLUSIONS.

1. Every case of chronic progressive middle ear deafness has a primary focus, which persists as a low grade infection, subject to acute exacerbations. In chronic cases such foci are usually multiple.

2. Such primary focus is usually constant for the individual and is indicated by the location of exacerbations.

3. Every case showing variable hearing can usually be improved up to their best hearing, or more.

4. So-called cases of nerve deafness of nonspecific origin are, in the experience of the writer, due to toxemia from some definite focus.

5. Inflation in chronic cases is unscientific and harmful as a routine, as the tube is already open and has partially lost its tone in the majority of cases, and in those cases not open it does nothing to remove the cause.

6. Nasal obstructions do no harm to the middle ear unless infection is present. Such obstructions, however, are the primary cause in the development of imperfect drainage, which predisposes to infection, and which is always present in cases of chronic secretory otitis media originating in the nose.

7. Foci, whether in the sinuses, tonsils, mandible or epipharynx, are potential factors in the progress of chronic progressive otitis media, either by direct extension or through the lymph and blood streams.

8. No hearing test will forecast the improvement in a given case as long as we have a positive Rin   with variable hearing.

9. Whatever the macroscopic appearance of the membrana tympani, the cause of the deafness is active for a long time outside the middle ear as a toxemia or low grade infection subject to acute exacerbations.

10. Constitutional diseases have but little effect upon the course of chronic secretory otitis media, except to lower the resistance of the patient and make him more susceptible to exacerbations of their localized focus or foci.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.
SECTION ON OTOTOLOGY.

Meeting of November 9, 1917.

Sinus Thrombosis With Meningeal Symptoms—Operation, Recovery.

DR. T. LAURENCE SAUNDERS: John L., aged seventeen years, a truck driver, was admitted to Bellevue Hospital May 13, 1916, with a history of having had a discharging ear for three weeks. For seven days he had suffered with stiff neck and vomiting; headache three days before admission, and chill the previous day.

Physical Examination.—Heart, lungs and abdomen negative; neck moderately stiff; bilateral Kernig; deep reflexes active.

Spinal Tap.—Fluid under tension, but clear.

White blood count, 23,000; polymorphonuclears, 80 per cent.

Urine negative, except for a very faint trace of albumin.

Temperature, 99 to 104 degrees; pulse, 80 to 110; respiration, 28 to 33.

On May 14, he was admitted to the New York Eye and Ear Infirmary, semidelirious and complaining of headache and stiff neck. He had a moderate Kernig, tender mastoid, fluid discharge from the ear; temperature, 104°; pulse, 110; respiration, 24. History of gradually increasing headache for one week, accompanied by chills, vomiting, and fever. History of discharging ear for three weeks.

Noise apparatus showed hearing; no nystagmus; caloric not performed.

Diagnosis of sinus thrombosis was made on history of chills and high temperature.

The vein was resected; it showed no clot and was not collapsed.

The radical mastoid operation revealed a sinus thrombosis

and epidural and perisinus abscesses extending almost to the torcular, with foul pus issuing from the sinus. Free bleeding was obtained from both ends.

After operation the patient did badly for a time; temperature, 99 to 104 degrees, and had repeated chills, with delirium and rigid neck.

Six days after operation the patient was out of doors and feeding every two hours, and thereafter continued to show gradual improvement.

May 18th. Headache; lumbar puncture cloudy.

May 22d. Headache better.

May 26th. Still some headache.

Normal course after May 29th.

DISCUSSION.

DR. GUNTZER asked what germ was found.

DR. SAUNDERS replied that streptococcus was found in the blood culture but nothing in the spinal fluid.

DR. GEORGE S. DIXON said that in cases of meningitis where there is a cloudy fluid and free blood, the globulin reaction will be positive. The sugar may still be present. There may be a high cell count, but unless germs are found in the fluid or cultivated from it these cases nearly always do well. That had been his experience, and he did not believe one was warranted in giving a grave prognosis unless positive cultures were obtained from the fluid, no matter how many cells were found. He had seen one case of pronounced meningitis with as low as 38 cells and another which appeared to be a case of purulent meningitis where there were several thousand cells, but he had come to look upon these cases as favorable if they did not show a positive cultivation from the fluid. It was quite common to have sugar persist, even in the presence of a well marked meningitis.

He had never, however, known a case of streptococcus mucosus capsulatus meningitis to recover. In his experience, this form of infection was invariably fatal.

Paper: Case of Purulent Otitic Meningitis With Unusual Clinical Symptoms and Pathologic Findings.*

BY CHARLES E. PERKINS, M. D.

Paper: Case of Hematoma of Old Radical Cavity Causing Persistent Pain.

DR. JOHN A. ROBINSON: H. W., aged thirty, was admitted to the New York Eye and Ear Infirmary on the service of Dr. Dench, on October 8, 1917, complaining of intense pain over the right mastoid area. He gave the following history: Some years ago he received a blow on the back of his head. He became unconscious, and so remained for three days. Upon his discharge from the hospital, his hearing was considerably impaired. Five years later he developed an acute purulent otitis, and underwent a simple mastoidectomy. Nine weeks later, for a recurrence, a secondary mastoidectomy was performed. Shortly after this operation he began to complain of persistent aural discharge, postaural swelling, and vertigo. He was again operated upon, a modified radical being done, the outer two-thirds of the posterior wall, the tympanic membrane and the ossicles were left intact.

The patient experienced no further trouble with the ear until the latter part of August, 1917, when he again began to complain of pain over the right mastoid area which was dull and constant. It became very marked in stooping, and caused vertigo with a tendency to fall to the right. For two weeks prior to his admission, the pain had assumed a stabbing character, confined chiefly to the right side of the head and preventing sleep.

Examination showed the old cicatrices slightly thickened; marked tenderness on pressure; pulse, 80; temperature, 99.8°; respiration, 20. A modified radical had been done. The posterior half of the cavity, which was dry, was filled with a bluish, tense swelling, resembling the sinus. A radiogram made by Dr. Dixon showed a suspicious looking area over the knee of the sinus. The patient did not hear the acumeter, but heard a low whisper at one foot.

Both labyrinths responded to caloric and rotation tests equally. The eye grounds and reflexes were normal; no nystagmus; no past-pointing.

*See page 978.

Operation, October 11, 1917. Usual curvilinear incision. On retracting the edges, the cavity was found to be occupied by a tense blue swelling. While endeavoring to obtain better exposure, it ruptured, and was surprised to get but a moderate hemorrhage, feeling that I had opened the sinus. With the cessation of the bleeding, I found that I was dealing with a hemotoma overlying the sinus, about the size of a white bean and with thick fibrous walls. The posterior portion was formed by the wall of the lateral sinus. The flaccid walls of the hematoma were trimmed. The remainder of the cavity was left undisturbed and the wound was closed. Close inspection of the posterior wall showed no apparent connection between the hematoma and the sinus. The pain which the patient had experienced was entirely relieved by the operation. Since then, however, he has at times complained of frontal headache, and occasionally a slow pulse. For this reason, he has been kept under observation, though repeated examinations of blood and spinal fluid have been negative.

DR. BLACKWELL asked how long was the interval between the relief of pain and the time the patient was admitted to the hospital and operated upon for the hematoma.

DR. ROBINSON replied that it was three weeks to a month.

DR. BLACKWELL said that in these modified radical operations—of which he had performed some twenty-three—his experience had been that a secondary drum membrane formed across the region of the antrum internal to and over the sinus, in the area to which he understood Dr. Robinson had stated the hematoma developed. This seemed to be a primitive attempt on the part of the drum membrane to restore itself, analogous to the attempt of other tissues to restore themselves after they have been removed. All were familiar with the development of this membrane in an old radical cavity. If in any way the patient while scratching the ear or endeavoring to remove wax should thrust a pin through, one could easily understand how a hematoma might form under it—or how even an acute catarrhal condition or an extravasation of fluid might form, closely resembling a hematoma.

**Case of Chronic Deafness Benefited by the Administration of
Pilocarpin.**

DR. C. M. SAUTTER: The use of pilocarpin for the treat-

ment of deafness has been advocated for many years, but in a perusal of the literature Dr. Sautter had not been able to find any definite data concerning the part of the auditory mechanism that is affected. The consensus of opinion seemed to be that the drug was especially efficacious in nerve deafness. He himself has used it frequently in cases of nerve deafness, otosclerosis, and in cases which he had been unable to attribute to some nasal or pharyngeal disturbance. When the pilocarpin is inflated directly into the middle ear through the eustachian catheter, the hearing and tinnitus are in some instances improved; but in comparing the tests the changes in the tone limits have always been in the lower vibrations. The question arises: Does the pilocarpin influence the change or is it induced by the routine inflation which is used to assist the injection into the tympanum, and what part of the auditory apparatus is influenced?

Occasionally he has administered the pilocarpin solution by mouth, especially in the case of patients who come from out of the city and find it difficult to return for extended treatments. In one of these cases the result was so obvious and constant that it seemed to be of sufficient importance to report.

Miss E., aged thirty years, single. First came under observation at St. Luke's Hospital in Dr. Dench's otologic service on July 6, 1915. She was employed as a bookkeeper and stated that she was afraid of losing her position because of her deafness. There was no history of any other deafness in the family. She also stated that she had been treated by a number of specialists for a considerable length of time—the treatment consisting principally of inflation—with no apparent change.

She gave a history of having had measles seven years ago, when she was seriously ill. At that time her ears discharged, and the right ear had been impaired ever since. Five years ago she fell on the back of her head and became completely deaf in the left ear. One year ago the deafness and tinnitus increased in the right ear. Both tympanic membranes were intact, but were slightly retracted and thickened. The nose and throat were apparently normal.

In testing, the left ear was totally deaf with the use of the noise apparatus, and the static labyrinth failed to react to

turning or ice water irrigation. With the right ear, patient heard moderate voice at three inches, but the watch was negative. Low limit at 55 d. v.; high limit, 9,290 d. v. Bone conduction was greater than air conduction. The static labyrinth was nonreactive. These limits remained the same after air inflation. Both tubes were very patent. A Wassermann reaction was negative.

Pilocarpin solution was given to the patient, with instructions to take it to the point of physiologic reaction or until a free perspiration was induced. Upon returning the following week, she stated that she had had a most profuse perspiration, with an immediate change of hearing which was quite perceptible to herself as well as to her family. In testing her again in the same environment, the left ear remained totally deaf and both static labyrinths inactive. In the right ear, however, she was able to hear the same watch at one inch and the moderate voice at eight feet. The low limit was now 16 d. v.; high limit, 9,290 d. v.

After an interval of more than two years, the patient returned upon invitation, June 2, 1917. The comparative tests showed the hearing to be identically the same, and she stated that she had very little tinnitus.

The change in this case was in the lower vibration from 55 d. v. to 16 d. v., or normal low limit. The hearing for the voice improved from three inches to eight feet, and for the watch from zero to one inch. Since she had previously had considerable inflation with no apparent benefit, and the only treatment administered in this instance was the pilocarpin solution by mouth, it seems quite obvious that the latter induced the improvement.

Paper: Reports of Mastoid Cases From an X-Ray Standpoint.*

BY GEORGE S. DIXON, M. D.

DR. BLACKWELL said he did not recall the particular case to which Dr. Dixon had referred, but that he had always found Dr. Dixon's plates of the greatest assistance in diagnosis when compared with the clinical evidence. The patients also have great faith in it, and sometimes when it is difficult to get them

*See page 986.

to consent to operation they will do so when shown the X-ray plate.

DR. GUTTMAN said that Dr. Dixon had told of his success with these findings; and it would be very interesting if the doctor would also tell of some cases where the X-ray findings were not corroborated by the operation—in other words, if either a negative X-ray showed findings not corroborated, or the reverse. He felt sure that Dr. Dixon must have encountered some such cases. All know that almost all cases of purulent otitis media implicate the antrum; sometimes these clear up, at other times the cloudiness remains, but that does not signify an indication for operation. While X-ray findings are undoubtedly of importance, sometimes they are very misleading. It is very difficult to determine whether the condition indicates a mastoid operation.

Dr. Guttman said that while he admitted that the X-ray findings have some value, he doubted whether their value was as great as one would be induced to believe from Dr. Dixon's report.

DR. DIXON said that he could hardly agree with Dr. Guttman in his last statement, that one can operate on a sinus on a plate alone. If there has been any disease in any sinus and it has been long continued—it does not matter how long after the affection—that sinus will be clouded. No surgeon is warranted in operating on X-ray plate evidence alone. He is warranted in operating where the X-ray plate shows that there is loss of bone if there are any clinical symptoms whatever to back it up, especially if it is increasing in size. The X-ray of any inflamed mastoid will give a cloudy plate, but that does not necessarily mean that it is an operative case.

Dr. Dixon said that very early in his work he decided not to say whether or not the routine mastoid was operative, but to report to the surgeon what was found, and to leave it to him to decide whether or not the clinical symptoms warranted him in opening the mastoid. But when he finds indications that bone has disappeared around or about the sinus, or in the squama, he feels that if there are any clinical symptoms whatever to back up the evidence, he is warranted in advising operation.

Take, for instance, the epidural abscess in Dr. Dann's case.

There was a distinct change in four days' time. We did not know it was capsulatus infection at first, but when it was found that the cavity had changed in four days' time, and that it was a capsulatus case, even though the patient had been doing fairly well, operation was advised. She had had some pain, and probably would have been allowed to drag along; but the moment positive evidence was found it was decided that it was time to operate, and Dr. Dann found the epidural abscess present at the operation.

Dr. Dixon said he did not claim never to make a mistake—he had not reached that degree of perfection—but he tried to make as few as possible. Any surgeon who would operate upon the strength of a plate alone would make a very grave mistake, unless there was some pathognomonic indication—a spot in the bone which should not be there, or that had been seen to develop during a series of X-ray examinations. Ordinarily, he must have symptoms to back it up. As Dr. Gruening used to say, "You must not forget the clinical symptoms." Blood count, blood cultivation, spinal fluid cultivation, and cell count are one point each in any laboratory diagnosis, and the plate has the same value in mastoiditis.

Paper: Clinical Observations in Subacute Mastoiditis.*

HUGH B. BLACKWELL, M. D.

DISCUSSION.

DR. SEYMOUR OPPENHEIMER said that there is probably no class of surgical work where the cases are so individual as in mastoid surgery. The indications for operation also are very individual; one man leans a little more to the conservative side than the other way; another leans a little more to the radical side, and the operations have to be studied by the indications in each particular case. It would almost seem as though the cases now are deviating more and more from the classical indications for operation. That thought has been brought very forcibly to my mind of late, for in spite of constantly increasing experience, one is constantly meeting with

*See page 999.

cases which seem to run such a curious type of symptoms that one is perplexed to know whether operation should be instituted or whether the case will be liable to clear up without interference. Every case seems to be a law unto itself, the determining factor often seeming to hinge on one particular symptom. In one it may be the quantity of the discharge, in another the changes in the canal wall, or in another a progressive increase in the polynuclear count.

In these subacute cases that Dr. Blackwell refers to, in one instance there may be a total lack of temperature and a total lack of the progressive fundus changes which we associate with mastoiditis; there may be an absence of all discharge; there may be a progressive polymorphonuclear count over a number of days. In another case with the same obscurity of symptoms the determining factor might be headache, or the X-ray might come to our aid and establish the indications for operative procedure.

It is difficult to understand why the cases of today seem to be different from those of ten years ago. The anatomic considerations are surely the same as ever. In individuals with a thin cortex, one would rather expect tenderness to be a prominent symptom; in a patient with a thick mastoid one would not expect any external manifestations; when there is a large pneumatic bone, one would not expect the same sharp symptoms found in mastoids constructed on the sclerotic type.

Dr. Blackwell's presentation brought up many points for discussion, but it is increasingly difficult to say what indications shall be accepted as establishing a safe and sane basis for operation.

Dr. J. M. SMITH said that he thought Dr. Blackwell had not laid sufficient stress upon the capsulatus infection. In the New York Eye and Ear Infirmary he had had occasion to attend a number of such cases, and had seen very few recover without operation. The type of cases termed subacute are very apt to be those in which this infection is present. He had seen such a case in March, with a three months' history, including seven operations on the drum. When he first saw this patient the only thing to be observed was a swelling back of the ear. The drum was almost normal, showing only a slight redness along the handle of the malleus. On account of the history,

capsulatus was suspected and he advised operation, and found the mastoid completely broken down. A smear showed this infection present. There was no discharge at all from the external auditory canal. Another case had had two incisions and had practically recovered, but there was a recurrence of the discharge, and operation showed a perisinus abscess with capsulatus infection.

It is especially this type of infection, after the initial symptoms of pain, tenderness and temperature, etc., have subsided, that continues to be dangerous, and so far as he had been able to determine, very few recover without operation. It would be interesting to know Dr. Dixon's experience in such cases.

Dr. DIXON said he had always taken the stand that the streptococcus capsulatus was the most insidious germ the otologist has to deal with, but that every case of capsulatus infection will do just as well as any other serious form of infection, if there is proper drainage. It is only when these cases are neglected that they become dangerous. It is the exception for a membrana tympani to become fairly normal and the mucosus capsulatus to go on with its work of destruction in the mastoid. What he called the neglected cases are those where the acute symptoms subside, leaving the patient with no pain; no temperature—nothing except discharge. When such cases continue two to six weeks, one is likely to find the mastoid a pulpy mass. That has happened over and over again in the infirmary.

However, the subacute and chronic cases of mastoiditis had given more satisfactory X-ray results than any other class of cases, for the simple reason that very frequently the X-ray would determine whether or not there was an abscess cavity to deal with. There may be few clinical symptoms and the drum membrane may look well, and yet the X-ray will show a broken down spot. The symptoms are such as uneasiness, not feeling perfectly well; a little pain one day and none the next. The patient may not sleep as well as usual. He feels that something is not quite right. Many of these cases will have existed for over a year. Dr. Coakley had sent in a case from South America. The patient was a great, strong, strapping man who came to the city on business, and went all over town to find out what was the matter with him. Some men

advised operation; others advised against it. Finally Dr. Coakley decided to make a more exhaustive investigation, and had an X-ray taken. It was found that the bone was broken down below the canal and around the sinus—a rather unusual location. Dr. Atkins, who assisted at the operation, said that he had never before seen such a deep destruction in a mastoid. There was no question in that case that the deciding factor was the X-ray; otherwise, the man would not have consented to the operation.

In many of these cases the bone is almost like a piece of ivory, no cells showing anywhere. These are dangerous, for the pus cannot get out. Those who have examined many prepared temporal bones will remember that in such cases the tegmen tympani and antri may be very thin. As a rule, these circumscribed abscess cavities do not occur in large pneumatic bones; the pus makes its way out, or the entire mastoid breaks down; but with a hard bone it cannot do so, and the pus will make its way in the line of least resistance. It was in just the class of cases that Dr. Blackwell had brought up that the X-ray proved most valuable, and it was very gratifying to have him connect up the clinical symptoms with the X-ray findings.

Dr. Dixon, in closing, again emphasized the position he has long maintained, that one should not expect too much of the X-ray examination: it is only one factor, but a very important factor, in establishing a diagnosis. The plate must be backed up by the clinical symptoms.

Dr. GUTTMAN said he was perfectly ready to admit that there is no absolute line of demarcation where operation of the mastoid begins and conservative treatment cases, and he was also ready to admit that streptococcus capsulatus cases rarely get well without operation, but Dr. Blackwell had not spoken of these cases, but of the real subacute cases found in purulent otitis media. It would be better to call such cases subacute otitis media rather than subacute mastoiditis, as we must not forget that the tympanic cavity and the mastoid antrum is only one cavity, and the affections of the tympanic cavity are the same as the affections of the antral cavity. Dr. Blackwell had spoken of opening the antrum and finding only granulations in the mastoid cells, and that the tympanic membrane sometimes showed only a small cone-shaped opening.

Dr. Guttman said he believed that if Dr. Blackwell would look into this matter further he would find that these complications are produced by insufficient drainage. In such cases, of course, sometimes the antrum must be operated; but if proper drainage is established through the tympanic membrane most of them will clear up without operation. Dr. Guttman then directed attention to the tympanic trephine which he had devised whereby a large opening could be made, enabling these cases to clear up without any mastoid operation.

DR. BLACKWELL said that he had been much interested in Dr. Oppenheimer's remarks in reference to the variations of different men's individual opinions in these subacute cases, and particularly of his experience of ear surgery ten or fifteen years ago, in that it seemed to him that then there were not so many of these subacute cases. He also had made this comparison, and it seemed to him that the reason for this lies in the fact that there were not then so many specialists, even proportionally, as there are today. Many of the men then were young in years and experience, and were probably prone to operate more quickly than they are today; they did not treat the cases so long as they do now before operating. It is also probable that many of these cases were treated by the general practitioners who did not notice these subacute conditions, but dismissed them as of little or no importance. Certainly all men form their individual judgments from their experience, in seeing cases, treating them, and operating upon them; and if, unfortunately the patients die, by postmortem examinations.

So far as the capsulatus infection is concerned, Dr. Blackwell said that he had stated in the paper that he considered all the streptococcus infections to be the most serious ones, including the capsulatus.

Replying to Dr. Guttman, he said he was sorry the doctor received the impression that he was speaking of otitis media rather than mastoid conditions; he had discussed subacute mastoid conditions. The semiresolution in these cases is caused by the fact that the middle ear cannot communicate with the mastoid. It is absolutely plugged. The middle ear not being reinfected from the mastoid, quickly undergoes resolution, and if anyone bases his opinion on the appearance of the middle ear he is apt to have a sad awaken-

ing. Dr. Blackwell said that he had had one very bitter experience in this respect and hoped not to have such another. One can speak of resolution as applied to the middle ear, where it is possible to actually observe it, but not as applied to the mastoid. The condition there may go on to almost anything—subperiosteal abscess, brain abscess, etc.

NEW YORK ACADEMY OF MEDICINE,
SECTION ON OTOTOLOGY.

Meeting of December 14, 1917.

**Acute Serous Labyrinthitis Complicating Acute Suppurative
Mastoiditis.**

DR. JOHN MCCOY: Giovanni La C., aged fifty-five years, Italian, was admitted to the hospital November 15, 1917, with the following history:

About the 5th of November, patient had an attack of the grippe which affected the nose and nasopharynx. Ten days later the patient noticed a pain in the left ear, which became quite severe. Four days ago a discharge started from the left ear, which has been copious in amount and of offensive odor. Patient stated that he had had severe vertigo since the trouble with his ear started. He said he felt as though he was drunk and could hardly walk, and that he had a tendency to fall to his left. The patient's relatives stated that he had never had any trouble of this kind previously.

Examination of right ear negative. Examination of the left ear showed the canal filled with purulent discharge, after the removal of which the membrana tympani seemed to be perforated, red and bulging above. No tenderness over the antrum; very slight over the mastoid tip. Temperature at time of admission, 100° F.

Functional examination showed hearing for the watch in the left ear negative; the whisper, fourteen inches; the voice, sixteen feet. Weber test referred to the right ear. Spontaneous nystagmus to the right. Turning test showed the right labyrinth functioning normally. Patient standing with eyes closed, fell to the left. Examination of the smear showed staphylococci. X-ray plate showed fairly pneumatic mastoid, both sides; the left quite cloudy. Examination of spinal fluid showed it to be clear and cells fifty-five per millimeter. Globulins plus. Fehlings plus. Cultivation negative.

Operation, November 17. On opening the cortex, pus and granulations were removed and the mastoid bone was found

to be extensively involved. The sinus was exposed for about one inch and epidural abscess found; the mastoid antrum was filled with granulations and pus. The patient was returned to the ward in good condition, and for the next three days his temperature ranged between 99 and 100.5 degrees. On the third day a complete dressing of the wound was done, which was found healthy. The patient's general condition was very much better. His dizziness, he said, was a great deal less, and the nystagmus was practically absent.

On November 25th the nystagmus had entirely disappeared. On turning to the right, he had nystagmus to the left for six seconds. With the noise apparatus in his right ear, he was unable to hear in his left ear the loudest voice or the Galton whistle. Weber was localized to the right side. The patient continued to improve, and he was discharged from the hospital on December 7th. He still returns for dressings. His labyrinth reactions are still about the same.

DISCUSSION.

DR. ALFRED KAHN said that he believed that acute labyrinthitis followed acute otitis media more frequently than was generally appreciated. Recently he had seen two cases in which dizziness developed after an acute process in the middle ear. This dizziness was associated with nystagmus toward the opposite side. In one instance the dizziness and nystagmus lasted over a period of two or three weeks, and the hearing in the diseased ear was entirely lost. In the other case which he has still under observation the nystagmus stopped after a period of a week, but the patient still feels dizzy. She is evidently getting well—her symptoms abating. Her hearing is slightly reduced in the diseased ear.

In such cases the prognosis as to hearing should be carefully remarked upon. Dr. Kahn said he had found that tincture of aconite gave some relief in acute processes of the labyrinth. He started with five drops, the patient being instructed to increase the dose one drop each time the medicine was taken. The drops were given three times a day. Some patients had been able to increase the dosage even up to a teaspoonful without any ill effect.

Pathologic Exenteration of the Middle Ear Without Operation.

DR. FRANK H. KNIGHT (by invitation): The patient was a longshoreman, forty-eight years of age, born in Roumania. He was referred to Dr. Knight by Dr. Ittelson for treatment, and two days later was admitted to the Manhattan Eye, Ear and Throat Hospital in Dr. Duel's service. His chief complaint was an itching sensation in the left ear and dizziness. This dizziness was at times so severe that he staggered and gave the impression that he had been drinking, which he claimed he did not do. Dr. Ittelson removed a mass of cerumen, epithelial cells, etc., from the ear.

Dr. Knight said that when he examined the patient there were no signs of any operative interference, either within or outside of the ear, but the external auditory meatus was larger than normal, and about one-half inch internally the canal suddenly enlarged into a large cavity. The posterior limits of this cavity could not be seen, but it seemed to go back into the region of the mastoid cells. The drum membrane and ossicles had disappeared; the posterior wall had been lowered, the canal and mastoid cells widened, so that the tympanic cavity, aditus, antrum and mastoid cells formed one large cavity.

It was an interesting question as to how this pathologic exenteration had taken place. Dr. Knight said he had recently operated on three cases in children, two at the Manhattan Eye and Ear Hospital and one referred by Dr. Page of White Plains, New York, in each of which there was a subperiosteal abscess, and on making the usual incision, retracting the soft parts and wiping away the pus and granulations, a considerable portion of the posterior wall of the external auditory canal was found to have become softened and disappeared. In one instance the lowering of the posterior wall was almost complete.

Dr. Knight said he thought that in this case there was probably a similar subperiosteal abscess. The wall became softened and disintegrated, and the abscess broke through into the canal, and that during the period of years following (thirty-two, he understood), the suppurative process had continued, the exenteration had taken place, resulting in the configuration as seen in the present large dry cavity.

After he had seen the patient two or three times, the man disappeared from observation, and he had not been able to make the ear tests as he would have liked. The man can hear the whispered voice eight inches or a foot away.

The dizziness was an interesting point, for it came on when the man was doing hard labor, when he puts his head back; or if he shuts his eyes in a street car he becomes dizzy. It has now lasted for twelve years. He has an ocular nystagmus but no spontaneous nystagmus.

An X-ray plate had been taken by Dr. Frederick M. Low, which showed very clearly the difference between the two sides. The right side is apparently normal, showing clearly the outlines of the cells; the left side shows the external auditory meatus much larger than normal. No cells are to be seen, but posterior to the sinus there is a sclerosis.

Dr. Knight said he believed the condition to be an uncommon occurrence.

DR. GUNTZER asked if there were any caloric symptoms. Did the man feel especially dizzy this cold weather?

DR. KNIGHT replied that the man did not complain particularly of cold air, though these cases usually do. The dizziness came on when walking, or when he lies down or throws his head back.

DR. HURD asked how Dr. Knight accounted for the fact that the labyrinthine process came on twenty years ago, and the history that the man who referred the patient got out a lot of waxy material. In his opinion it looked more like a cholesteatomatous exenteration, and there might be some cholesteatomatous process still going on.

DR. GUNTZER said he did not think it a fair inference that the pathologic process was the same in this case and in the child's case which Dr. Knight cited. The man had had this process for thirty years. Was there any odor?

DR. KNIGHT replied that there was no odor, and that he found no evidence of any discharge.

DR. FORBES asked if the absence of odor would not rather negative the theory of a cholesteatomatous process.

DR. GUNTZER said that it was a very interesting case. The ear seemed perfectly smooth and perfectly dry. Such cases were not very common.

DR. KNIGHT, replying to Dr. Hurd's comment, said that he had tried the fistula test, but had not been able to detect any fistula. He could not say why the dizziness should come on after ten or twelve years. On account of not being able to keep in touch with the patient he had not been able to make as thorough a test as he would like. The Wassermann test had not been made, nor examination for evidence of tabes. In regard to cholesteatoma, very likely there had been formation of cholesteatoma, for there seemed to be epithelial cells in the mass Dr. Ittelson removed. Dr. Amberg, in 1912, mentioned a similar case, the only one he (Dr. Knight) had been able to find.

Having seen the other cases recently, he was inclined to believe that this one also might have occurred in that way, and to feel that it was due to a subperiosteal abscess breaking through, as the starting point.

Extensive Tuberculosis of Both Mastoids and Middle Ear.

DR. L. M. HURD: The patient was a little girl, seven years of age, who came under his observation early last spring with a history of mastoid trouble in both ears, of three months' duration. The ears were still running, and there was a fistula behind one ear. There was some swelling over the left mastoid and considerable induration of the glands of the neck on both sides. The condition aroused suspicion of tuberculosis, and she was sent to the hospital. The mastoids were opened up and were found to be entirely filled with a gelatinous granulation tissue and a kind of flocculent fluid. Feeling convinced that it was a case of tuberculosis, Dr. Hurd did not clean out the mastoid. The condition extended from the semicircular canals into the petrous portion. This also he did not clean out, but closed the wounds and treated the case with bismuth paste. Three months later he saw the child, and one ear was well; the other had a sinus running back an inch and a half. He instructed the parents to resume the bismuth paste treatment, and recently he had had a letter saying that the child was in fine condition. The hearing test was five inches right and one-half inch left with the watch. The patient was one of those crying children, and nothing could be done with the labyrinthine test. Apparently, however, the labyrinth was intact within the granulating mass.

Dr. Hurd, replying to an inquiry from Dr. Guntzer, said that the pathologist reported the condition to be a tuberculous granuloma. In his own opinion, the less one does for a tuberculous mastoid, the better for the patient.

**Acute Mastoiditis Complicated by Thrombosis of the Sigmoid Sinus
Extending Down Into the Jugular Bulb and Internal
Jugular Vein.**

DR. L. M. HURD: The patient was a woman apparently about thirty-five years of age. Two years ago Dr. Hurd was called up by another physician, who asked if he could do a mastoid operation that day (Thanksgiving). He said that the patient was an employee in a hotel who had been missed from her usual position, and upon inquiry was reported to be ill. Later on, one of the attendants said that she was being treated by Christian Science for ear trouble, and was growing worse. Then this physician went to see her and found her in a very pitiable condition, with an enormous mastoid swelling.

Dr. Hurd agreed to operate that afternoon, and she was sent to the hospital. On reaching there about four o'clock, the patient was put upon the operating table, and he opened up this mass. Under the periosteum was about two ounces of pus. Upon evacuating this fetid pus the cortex was found to be purplish and congested, but there was no perforation. Evidently it was a Bezold. The interior of the mastoid was a mass of soft mushy granulations. The dura was exposed over the antrum and sinus, and in the vein a thrombosis was found. A free flow was obtained above the knee, also below the thrombosis. The pus had burrowed between the dura and the skull, between the skull and periosteum. An extensive piece of bone was removed, and the tip and petrous cells were removed nearly to the foramen magnum. The pus had burrowed down the muscles of the neck across the transverse process and along anterior to the sternomastoid muscle. This was evacuated. The patient was in very poor condition. Before the operation she was asked if she had had any chills, and she replied in the negative. She had the attitude of the Christian Scientist, that nothing was the matter with her.

That night she had a chill, and a temperature of 106. The next day she went on all right, but the next day she had another chill and high temperature. On Saturday she had an-

other chill while waiting to be sent to the operating room. On reaching there she was nearly moribund. The neck was opened without anesthesia. After this the patient was returned to bed and made a prompt and uneventful recovery.

The pus pockets went down in three or four directions. No counter drainage was instituted, but the pockets were filled with bismuth paste. A general surgeon who was present said counter drainage of the pockets only would cure, to which Dr. Hurd replied, "All right," and went on injecting bismuth paste. In about three weeks after the operation all the sinuses down to the periosteum and bone had healed and the wound was entirely dry in January.

Dr. Hurd said he had not seen the patient for about a year, but had asked her to come to the meeting tonight.

DR. VOISLAWSKY said that Dr. Hurd's case was a demonstration of the fact that it is a great mistake not to ligate the jugular in a case of sinus thrombosis. He disclaimed any idea of criticism of Dr. Hurd, for he would certainly have done it if the condition of the patient had warranted it. Dr. Hurd was certainly to be congratulated on the successful issue of the case and in being able to present the patient in such excellent condition. The case merely brings up again the question that has been thrashed out so many times—about excising or ligating the jugular, when the sinus contains a clot or is thrombosed. In this case the jugular was not excised, only tied off. It is quickly and easily done, and the physician and the patient would both be saved much if every thrombosed sinus was so treated.

Fistula of External Semicircular Canal Occurring in a Case of Acute Suppurative Mastoiditis.

DR. JOHN MCCOY: J. M., aged sixty-four years, a native of Canada, entered the hospital August 8, 1917, with the following history:

Following a cold in the head, he developed pain and fullness in the right ear. The right drum was opened on July 6th. The ear discharged for two weeks and then dried up. Since the discharge stopped, he had had a dull pain over the mastoid and over the right side of the head. When examined on August 8th, which was about five weeks after the beginning of the attack and about three weeks after the ear discharge had

dried up, he presented the following conditions: The external ear was dry, the ear drum appeared congested and somewhat thickened, and without any bulging. There was a tenderness over the mastoid antrum and the tip, elicited on pressure. His temperature was normal. An X-ray of the mastoid showed an abscess in the mastoid cavity with a melting away of the bony partitions. A mastoid operation was advised and performed the following day.

The operation disclosed the following conditions: Granulations and free pus throughout the entire mastoid. The inner plate over the sinus was eroded from practically the knee to the bulb and there were granulations and pus on the dura beneath the lower part of the sinus where it swings anteriorly into the bulb. There was also a well marked fistulous opening into the external semicircular canal. As the patient had complained of no symptoms referable to his labyrinth, it was decided not to operate on the labyrinth. The mastoid was thoroughly exenterated and the patient was returned to bed in good condition. The day following the operation his temperature was 100° per rectum, and his convalescence was apparently normal in every way for five days. During this time the patient said he felt perfectly well; that he was not now nor had he been dizzy or unsteady in his gait. On the fifth day his temperature rose to 105°, and he was again taken to the operating room. A spinal puncture was made and turbid cerebrospinal fluid was withdrawn. The wound was reopened along its entire length and found to be healthy. The sinus was opened to see if there might be a suppurating clot within, but it was found to be healthy and bled freely from both ends. The cerebrospinal fluid showed streptococcus in long chains. The patient failed very rapidly and died the following day.

This case was presented as a companion to the preceding case. In the one, apparently serious labyrinthine symptoms subsided with conservative treatment. In the latter, there is a possibility that the meninges became infected by way of the fistula in the external semicircular canal, and yet the writer did not feel that such was the case, without giving any symptoms of the labyrinthine irritation, but rather that, due to free pus in contact with the dura and no drainage for several weeks, the infection spread through the dura.

Pneumonia With Interesting Otitic Complications.

DR. SEYMOUR OPPENHEIMER: B. S., aged fourteen months. Seen in consultation on October 31st. Child became ill about October 10th, with a temperature averaging about 102° for a period of eighteen days. Diagnosis, influenza. On October 28th the temperature rose to 104°, and Dr. E. Riesenfeld assumed charge of the case.

Examination showed a marked state of congestion of the mucous membranes of the upper respiratory tract. After two days' observation, the temperature ranging from 104 to nearly 106 degrees, a questionable area of consolidation, very small in size, was discovered at the right posterior lobe of the lung. The drum membranes were markedly reddened and bulging, and a double myringotomy was performed by Dr. Milton Ballin. As the discharge was very scant and the temperature did not subside, and as the tympanic membranes showed the evidence of a lack of free drainage, the following day myringotomy was again performed, followed by a profuse purulent discharge from both ears. A blood culture taken at this time was positive, the pneumococcus being found. No ear culture had been taken. On October 30th the temperature after a remission from 105 to 99 degrees, rose sharply to 107°, followed by a rapid fall to 98°, and then rose again sharply to nearly 106°. At this time I saw the patient, and in analyzing all the facts determined, firstly, that there was no demonstrable disease of the mastoid, and concluded, in view of the fact that no absolute assurance could be given me that a pulmonic process was present, that we might be dealing with a primary jugular bulbar thrombosis. I expressed the opinion, however, that in a series of over one hundred cases of sinus thrombosis I had never found a case where a pneumococcus was present in the blood stream, the organism being always the streptococcus or streptococcus mucosus, and that I would advise deferring interference a short period to determine whether some more definite lesion could not be found in the lungs.

I might say in passing that it is not infrequent to find the pneumococcus in the blood in the early stages of a pulmonic process. A day or two later the local ear symptoms had not progressed, and the attending physician definitely stated that there were the evidences of a right lobe consolidation. The

temperature remained at 105 to 106 degrees for several days and subsided by lysis with a complete recovery of the patient.

This case is simply presented as showing the possibilities of an error in diagnosis.

Extradural Abscess and Fulminating Meningitis.

DR. SEYMOUR OPPENHEIMER: A. L. H., aged eight years. For two days patient had a slight cold with a mild temperature, and complained of occasional pain in the left ear. On the evening of June 12th the patient was seen by me at Elberon, New Jersey. After examination a myringotomy was performed, which procedure was followed by a few drops of serum from the middle ear cavity. Slight pain was complained of upon pressure over the antetragal region. The myringotomy was followed by a relief of the pain, and the temperature dropped to normal. The child fell asleep shortly thereafter.

Later in the evening the little patient became very restless but did not give the parents any anxiety until midnight when some delirium manifested itself. At this time Dr. Edwin Steirberger and myself were hastily summoned. We found the child in absolute coma, with marked convulsive movements of the entire right half of the body, the face being paralyzed. The left pupil was dilated and the right retracted. Opisthotonos was extreme. An external strabismus was noted and nystagmoid movements of the eyes were pronounced. Temperature 105°, pulse 180, respirations 36. The patient was promptly placed in a hot bath and morphin administered, and arrangements were quickly made to remove the child to the Monmouth Memorial Hospital at Long Branch, several miles distant.

The mastoid process was quickly opened and found normal. A large area of bone was removed over the squamous plate of the temporal bone. The dura was found to be extremely tense, but did not show at this site any inflammatory process. Suboccipital decompression was also performed by removing an area of bone posterior to the mastoid.

In searching over the extradural spaces, a few drops of pus were located well anterior over the root of the zygoma. A large portion of bone was removed in this direction so as to expose this region thoroughly to view. A mild inflammatory process

of the dura was noted at this point. A lumbar puncture was then made, and about ten cubic centimeters of fluid under considerable pressure and slightly turbid in character was removed. No microorganisms were found in the smear nor were any found in the cultured material, but cellular count was markedly increased.

After all the operative procedures had been completed, Dr. Charles Elsberg arrived from New York, and we remained that day in constant attendance upon the child. The temperature had dropped steadily to $99\frac{1}{2}^{\circ}$, and the comatose state cleared up, the entire picture improving following the cranial decompression means employed. Other than the complaint of headache no symptoms were manifest, although a definite bilateral Kernig was recognized, with some neck rigidity.

The following day, June 14th, some retinal congestion was noted and a definite optic aphasia, which, as well as the Kernig and neck rigidity, decidedly improved for the ensuing four days. The patient apparently was much improved, although the temperature showed a steady tendency to rise each day a trifle, reaching to nearly 103° on the afternoon of the sixth day. At this time the dressings were removed and the wounds were found to be very clean. The evidences of a meningeal irritation became more manifest, and at Dr. Elsberg's suggestion Dakin's method of flushing was employed over the exposed dural areas; on the following day lumbar puncture was again employed, and fifteen cubic centimeters of fluid under great pressure was removed. This contained some seventy per cent of polynuclear cells, but again no microorganisms were found in the smear.

The brain was exposed in various directions by Dr. Elsberg and myself, but no localized abscess could be encountered. The dura over the tegmen tympani was then incised and a large area of brain tissue was found to be softened and breaking down. This encephalitic process accounted well for the symptoms of aphasia. From then on all evidences of a rapidly spreading meningitis asserted themselves, the patient succumbing the following day.

Only in the last lumbar puncture fluid were microorganisms found, they being the streptococcus mucosus. The interesting features of this tragic case were the violent onset of the symp-

toms, the relief of the same after the decompression operation, the absence of all the disease in the mastoid, the route of infection being anterior through the zygomatic root, the finding of an extra dural collection of pus at this site, starting from which an area of encephalitis developed, which of course was beyond the reach of any surgical intervention.

Sinus Thrombosis With Metastases.

DR. SEYMOUR OPPENHEIMER: J. W., aged ten years. Admitted to Mt. Sinai Hospital July 30, 1917.

Previous History.—Since ten days, purulent discharge from right ear with some temperature.

Examination of the ear showed a moderate amount of secretion in the external auditory canal of the right ear, with a small perforation in the anterior inferior quadrant. No evidence of retention, nor any mastoid involvement.

The case was kept under observation in the ward of the hospital. Six days later some slight neck stiffness was noted with a suggestive Kernig and Babinski. Also a beginning papillitis. The ear was apparently resolving. Lumbar puncture showed an increased cell count to 36 per cubic millimeter, with a polynuclear count to 66 per cent. Temperature rather stationary, about 102. Blood culture and widals negative.

On the eleventh day after admission the neck rigidity, Kernig and ankle clonus becoming more marked, but the ear symptoms abating, pain was complained of in the left shoulder and right ankle. Blood culture taken at this time was reported as showing the streptococcus hemolyticus. White blood count, 24,000. Polynuclear count, 85 per cent.

At the time of the submission of the above report, tenderness and swelling appeared over the right and left knee, and two chills were experienced by the patient, followed by a considerable rise of temperature.

An operation was advised upon the mastoid and sigmoid sinus, as it was reasoned that these articular swellings were the metastatic evidences of a thrombotic process. Exploration of these regions failed to show any involvement of the mastoid, nor could any thrombus, even parietal, be demonstrated, although at one point the vein wall appeared rather thickened. The jugular vein was not tied at this time, but was subsequently ligated, as the blood cultures remained positive, which

was followed several days later by the report of a negative culture. During this period a large number of metastatic conditions manifested themselves, such as effusions into various joints and abscesses of the skin. The left hip joint required surgical interference, and a large quantity of pus was evacuated from this site. A general septicemic process developed, from which the patient succumbed on September 20, 1917.

Among the numerous interesting points which this case brings up for thought is, firstly, whether in the presence of the evidences of an arthritic process and a coexisting aural suppuration and a positive blood culture, whether it would not have been a justifiable plan to have immediately ligated the jugular vein, even though a demonstrable thrombosis could not be determined, and again, in the presence of the above mentioned groups of symptoms, namely, a metastatic process, a preexisting aural suppuration and a positive blood culture, whether this could not be construed as the definite evidence of a phlebitic infection.

Mastoiditis With Meningitis Arising Four Weeks After Operation.

DR. SEYMOUR OPPENHEIMER: M. T., aged forty years. Admitted to my service at Mt. Sinai Hospital on July 7, 1917, complaining of pain over the left side of the head since four weeks, during which time there was some temperature and a loss of weight of fifty pounds. The previous day a spontaneous bloody discharge took place from the left ear.

Examination showed some tenderness over the mastoid tip and posterior border, with a profuse purulent discharge from the external auditory canal, with some evidences of retention. Myringotomy was promptly performed.

Hearing for conversation voice with exclusion of the unaffected ear was six feet, with the Weber lateralized to the affected side. The static labyrinth was demonstrated to be functioning normally. Ocular examination negative.

Two days after admission a mastoid operation was performed, at my direction, by Dr. Auerbach. The operative findings consisted of a perisinus abscess with an epidural collection of pus over the tegmen, in the middle cranial fossa. Bacteriologic examination of this pus showed the presence of the streptococcus mucosus. Four weeks after the operation, the patient convalescing in the hospital with the mastoid

wound almost closed, the temperature rose suddenly to 104°, with the rapid development of all the signs of a meningitis. Lumbar puncture was immediately performed. The spinal fluid was under great tension and very turbid, and contained 260 cells to the cubic millimeter, with a 98 per cent polynuclear count. No organisms were found in the smear, but very abundant in the culture (the streptococcus hemolyticus). An exploratory craniotomy and temporal decompression was promptly made, but no route of infection could be determined.

Some hours later the testing of the labyrinth showed the same to be absolutely nonfunctionating. Fundi negative. The general condition of the patient being so critical, an operation upon the labyrinth was not undertaken. Death ensued in thirty-six hours after the onset of these symptoms. An autopsy could not be obtained.

The interesting features which this case brings up for discussion are: Firstly, the unknown possibilities of reinfection, or rather the lurking of infection in these cases of streptococcus mucosus; and secondly, how without any recognizable symptoms a labyrinth which was demonstrated to be functioning normally became the seat of a probable suppurative process, with the ensuing meningitis, while the patient was up and about in the hospital under proper observation, proving how rapid may be the transition from an unrecognized perilabyrinthial inflammation to a complete destructive process.

DISCUSSION.

DR. CARTER asked if Dr. Oppenheimer did not think that complications involving the mastoid and the sinus were fairly uncommon in infections of the middle ear accompanying pneumonia. Last year in the Children's Wards of Gouverneur Hospital there were a great many pneumonia cases—over a hundred—and fully half of these cases had involvement of the middle ear, yet not a single one of those cases was complicated by mastoiditis or sinus involvement or other complication of middle ear trouble.

He also asked if Dr. Oppenheimer had not noticed in the epidemic of pneumonia last year an unusual proportion of cases with middle ear conditions. This year also there has been quite a number of cases of pneumonia in the children's

wards, but so far he had not seen any middle ear involvements; whereas, last year they quite got into the habit of expecting it.

DR. GUNTZER said it was commendable that Dr. Oppenheimer reported these cases from the negative point of view, as we usually get the other side. He had seen a parallel case in the country, but having no facilities for blood culture he had to rely entirely on the physical and clinical symptoms, for the physician in charge would not send the case to the hospital. There was no clinical evidence of any kind of mastoid involvement; there was the jumping septic temperature, but on the fourth day he made out a pneumatic process. We ought to keep in mind the clinical symptoms end of it, along with the laboratory findings.

DR. HURD said he thought there was liability of the ear condition overshadowing the general condition. Recently an Italian was brought into the hospital with a history of having had the mastoid operated on the week before, and since he had been running a very high temperature and had developed a facial paralysis. When seen in the hospital his temperature was 105° and he had a dead labyrinth and a little bronchitis, which was thought due to the anesthetic. However, it was decided to go in and do what could be done. At the operation an enormous cholesteatomatous mass was found invading the labyrinth; the sinus was opened but nothing found. The facial nerve was affected by the pressure. The patient was returned to bed and developed a temperature of 105 to 106 degrees. A physician was then called in, and he said the patient was developing an acute miliary tuberculosis of the lungs, and the man died of tuberculosis. While he needed to have something done for his ear, his serious symptoms had nothing to do with that condition.

DR. KAHN said he judged from Dr. Oppenheimer's report of his case of meningitis that the patient progressed fairly well up to the time that the dura was incised. He thought it was poor surgery to incise the dura for the relief of brain tension in the presence of an infection, this notwithstanding the fact that the procedure was considered correct. He thought that it was all right to expose a large area of dura for decompression purposes, but he could not see the rationale of exposing the subdural space to infection. In looking over the lit-

erature on this subject he had noted a very large percentage of deaths where the subdural space was opened. In the labyrinth operation (Richards) operators were extremely careful not to expose the subdural space. Why should not this law hold for the subdural space in other localities? He did not think the results warranted the procedure.

DR. HURD, referring to the case of mastoiditis with meningitis, said that a year ago he was called to a town in New Jersey in see an eleven months old baby who had had a mastoid operation performed four weeks previously. (A week after the operation he had had a flush of blood at time of dressing.) The mastoid wound had practically healed leaving only a small scab, and the middle ear was dry. For three or four days the child had been running a high intermittent temperature, ranging from normal to 104-105 degrees. The surgeon who performed the mastoid said that the mastoid condition was all right, but the family wanted Dr. Hurd's opinion. Dr. Hurd said he knew the family physician, who was good with children and had confidence in his judgment. It was thought that the sinus might be the cause of the trouble. Accordingly it was decided to operate, and a small sigmoid sinus was uncovered, but there was no thrombosis or thickened wall. It was opened up, however, and the jugular vein was tied off. The child had no further rise of temperature and got well. He had not seen it since.

DR. SEYMOUR OPPENHEIMER, replying to Dr. Carter's inquiry in regard to middle ear infections in pneumonia, said that they were not so frequent as are seen in many other acute infectious diseases, though many cases do have red drums requiring myringotomy. That, however, was not the point he had tried to make. He was trying to emphasize the confusing thought that might arise on finding pneumococcus in the blood stream, presuming that the clinical picture would be suggestive of a sinus thrombotic process; that his experience to date has been that the pneumococcus has never been recovered from the blood in any of his cases of sinus thrombosis. That is important in many ways from the prognostic standpoint. For example, a mastoid operation has been performed and there has been recovered the pneumococcus from the mastoid pus; subsequently the patient begins to run a temperature that

might be considered as due to a sinus thrombosis. He has felt reasonably safe in saying that the patient was not developing a sinus thrombosis if the mastoid pus had demonstrated the pneumococcus. This opinion has always been justified subsequently by finding some other explanation for the symptoms other than the existence of a sinus thrombosis.

Dr. Carter had asked if last year there had not been more ear complications in the pneumonia cases than in other epidemics. Dr. Oppenheimer said that this had been observed, but that the explanation lay in the fact that many of the pneumonia cases had been complicated with influenza, in other words, a mixed infection.

In regard to the case of extradural abscess, the question had been raised as to the wisdom of the dural incision. Dr. Oppenheimer said he was thoroughly in accord with the statement that the dural incision is very bad practice; but in this unfortunate case the dura was not incised for the purpose of draining the subdural space. Some days later, however, when the severe symptoms indicated that the patient was in a very critical state, the brain was punctured in various directions in the hope of finding the abscess, and it was then that a dural flap was made and a large area of encephalitis was found. Dr. Oppenheimer said he thought subdural drainage was a delusion and a snare; what cannot be accomplished by lumbar puncture cannot be accomplished by subdural drainage. With the exception of cisterna magna drainage, at any other site you have within a very few hours a pretty definite binding together of the pia arachnoid and dura, and drainage does not take place.

Dr. Oppenheimer said he was quite in accord with Dr. Voislowsky in feeling that one is exposing the brain to added infection by this practice, and he was satisfied that in every case of meningitis where the dura has been incised, that probably an additional factor has been supplied which has hastened the end.

Paper: Notes on a Case of Meningitis of Otitic Origin.*

By ALFRED KAHN, M. D.

DISCUSSION.

DR. HURD asked what Dr. Kahn meant by the expression "cerebral decompression." It was a little confusing.

DR. KAHN said that cerebral decompression is very often done as a therapeutic measure in meningitis. His idea is that it is practiced in two ways: First, by removing the bony cortex of the skull and exposing a large area of dura, the idea being that the brain will then have room for expansion, as the dura offers less resistance than the bony skull; second, cerebral decompression is practiced by going a step further and incising the dura, exposing the subdural space. This procedure not only allows for expansion of the brain substance but is supposed to drain the subdural space, thereby relieving tension. The danger of this second procedure is that, should infection enter the subdural space the result is almost sure to be fatal, as once the brain is invaded beyond the dura—the dura is the strong line of resistance between the brain and the outside—serious results are almost sure to follow.

DR. HURD responded that the dura is a pretty tough membrane and does not bulge much. When you really want to decompress the brain you have to go into the temporal region and open the dura.

DR. KAHN replied that the dura is not as resistant as the bony cortex.

Dr. Kahn stated that the method is practiced. As to its value he is not in a position to say. It would seem, however, that the dura offers less resistance than the bone, and that where an area of bone is removed the dura will tighten (hernia) into the opening, thus reducing tension. Of course the decompression is not as effective as where the dura is incised, but the latter procedure markedly increases the risk. He is not in a position to state what decompression value merely exposing the dura over a large surface has, but he does know that the method is practiced.

DR. HURD said that was another question. Can you have a hernia with dura intact?

*See page 1004.

DR. GUNTZER asked if Dr. Kahn had any idea where the pressure was relieved.

DR. KAHN stated that the case was one of meningitis. The patient was unconscious and delirious. He had an extremely high temperature. He had stiffening of the neck and back. Kernig sign was present. He had a high blood count. He had an unusually high spinal fluid cell count. He unquestionably had meningitis.

The Second Operation.—The patient was taken to the operating room the second time merely to examine the wound from the previous operation to see if there was any discernible reason for his symptoms—as a routine matter, in order to give the man any possible chance that such an examination might offer. The dressing was removed and the wound examined, but nothing was found. On account of the high temperature the lateral sinus was again opened and explored between the mastoid opening and the torcula, but no point of infection was located. The sinus bled very freely from above. This was the only thing accomplished by the second operation. The temperature promptly dropped and the next morning the patient regained consciousness and later recovered.

DR. GUNTZER said he had asked the question because some years ago Dr. Haskin presented a good many anatomic studies in discussing the cause of abducens paralysis and papillitis; and with the aid of these studies he worked out a definite reason for it—a vascular or sinus pressure at the foramen.

DR. VOISLAWSKY asked if it was not possible that the bleeding might have washed the clot away, inasmuch as the clot is not always apparent in the opening.

DR. KAHN replied that it was possible that it might have happened, but he did not think that had occurred, as the blood was very clear.

DR. OPPENHEIMER said he did not think one could call it a decompression operation when only a small piece of bone was removed. In the decompression operation of the general surgeon a large osteoplastic flap is removed. The benefit he believed to be as much due to the lumbar puncture therapy as to the removal of a small area of bone. One should not be homeopathic in taking out a flap of bone.

He could not see the rationale of the sinus bleeding which

Dr. Kahn referred to as a decompressive measure, for you replace the same amount of pressure from the packing necessary to control the bleeding. It is a question whether that does not exert more pressure on the brain than the amount of blood lost.

He did not believe that one ever gets a hernia from a small exposure of the dura. You do get a hernia when you incise the brain—and the brain is infected. Cerebral hernia is a sign of brain infection, excluding that type of case, where you have removed the entire roof of the mastoid, the wound has healed and some reinfection takes place subsequently, and increased intracranial pressure, and there is prolapse of the brain with the dural covering into the exenterated cavity; but from simple exposure of the dura he doubted whether a hernia would result.

DR. KAHN further stated that he had not had any very great experience with such cases, and that he merely reported the case stating what he had done and giving his own ideas about the matter. He simply stated his ideas for what they were worth, not as a fact. As previously stated, the only thing accomplished at the second operation was the free bleeding from the sinus. The patient's prognosis was practically hopeless, and in the absence of anything else other than the free bleeding, he assumed that recovery was due to this fact. Regarding brain hernia, he did not want it understood that you could have a hernia in the sense that a large portion of the organ could push itself through the bony cortical opening. The brain has a tendency to tighten itself into the opening, but as a matter of fact the operation of exposing a large area of brain without incising the dura is often done. If it is not done for decompression, he would like to know what is the purpose.

DR. OPPENHEIMER, referring to the spinal fluid findings, said that it had never come within his experience that the cell count had been as high as in the case reported by Dr. Kahn, and bacteriologically sterile. He knew of many instances where the cell count had been high and no bacteria found in the smear, but they had always been found in the cultures. This was a case of an increased leucocytosis of the spinal fluid, and might be construed as aseptic (serous) meningitis rather

than a bacterial meningitis. Otherwise he was satisfied the patient would not have recovered.

DR. KAHN further stated that the spinal fluid contained cells equal to pus; the culture was sterile. Fehlings was minus, and the globulins were four plus the morning of the second operation. The globulins were later reduced to two plus on the next spinal fluid examination after the operation. This is mentioned to show that although the fluid was negative (no germs being found) there must have been some kind of an infection to cause a minus Fehling and such a high globulin reaction. It might be that the spinal fluid has some germicidal effect.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Meeting of November 20, 1917.

Dentigerous Cyst.

DR. JOSEPH BECK presented a patient with a dentigerous cyst. The patient was a little boy who had a unilateral swelling of the right side of the face, which was hard on palpation and which had been present for about ten months. There was associated with it a very foul odor from the mouth. It was not painful. On palpation directly over the swelling in the mouth an indentation could be made which was effaced when the pressure was removed. It felt like pasteboard, did not give a crackling sound, but responded to pressure. This was the cardinal symptom of a dentigerous cyst, which was the diagnosis. The diagnosis was proved by X-ray pictures taken both in films and in posteroanterior exposure. The teeth in the cyst were merely formed and unable to erupt. They appeared to be the incisors and premolars. Puncture of such a cyst usually revealed fluid of a gelatinous nature. Dr. Beck showed pictures of other dentigerous cysts.

Dentigerous Cyst.

DR. HARRY L. POLLOCK showed a young man whom he had seen for the first time on the previous morning. He complained of a swelling over the right antral region, which had been present for about a month. During this time he noticed that the right side of the nose was not as free as the other. There was no pain, but when he bit on that side he could feel the teeth give a little. A very soft tumor, which was crepitant, could be felt over the antrum. A dentigerous cyst was suspected and the X-ray examination proved that diagnosis correct.

Vibratory Mechanism.

DR. ROBERT SONNENSCHNEIN demonstrated a small vibratory mechanism which could be used as a noise apparatus in testing for unilateral deafness. It was operated by a small, dry cell battery which retailed for about thirty-five cents. The appli-

ance was made by Sharp & Smith, and sold for \$5.00. The other noise apparatuses previously used were the Neumann, which was very expensive, and the Bárány, which is now practically unobtainable on account of the war, and it had cost a considerable sum.

The disadvantage of this instrument was the fact that a good deal of outside noise was being produced, but efforts were being made to overcome this defect. In testing patients, however, with the apparatus in one ear it was found that despite this noise they were able to hear even the whispered voice in the other ear.

The advantages of the appliances were its cheapness, its portability and ease of manipulation. At least during the war it might help out in the absence of the Bárány apparatus.

DISCUSSION.

DR. LOEWY was of the opinion that with two such apparatuses and a switch they could be used as a malingering test, just as was done with a noise apparatus.

Paper: Dentigerous Cysts, With Report of Case; X-ray Plates.*

BY IRA FRANK, M. D.

DISCUSSION.

DR. JOSEPH BECK regretted that Dr. Frank had not spoken more at length regarding treatment. The treatment was interesting because recurrences were frequent. Before he adopted his present method of treatment he had nothing but recurrences. Scraping the teeth out with a curette was followed by healing, only to have the growth return. A small vestige of the epithelium would remain in some part of the cyst and a recurrence would take place. The treatment which had given him absolutely perfect results was as follows: In opening the cyst the cavity was thoroughly scraped with a curette, the whole lateral and anterior wall was removed with forceps and then the burr was used to remove the surface of the bone so that there were no remains of the epithelium. Then the cavity was filled with a mixture of spermaceti, wax and iodine—33 per cent spermaceti, 66 per cent paraffin, and enough

*See page 991.

iodin—about one-half of 1 per cent—was the mixture which was used originally by Moroff in healing cavities of the leg. This was packed in tight in the cavity, and the mucous membrane of the lip side was wired to the surface above the teeth. The wax was allowed to remain in, and it could be seen to be extruded until the cavity was filled up. There had never been any recurrence since adopting that treatment. In the case of the boy he exhibited, he expected to adopt another method, which he thought would be even more satisfactory. This was based upon some experiments he was making with a mixture of ground up cartilage, wax and iodoform. The costal cartilage contained a substance which was eminently satisfactory for filling out a cavity—more so than the inert substances.

One of the most interesting cases he had had was that of a lady who had a dentigerous cyst which was drained and washed and recurred for two or three years. X-ray examination showed a tooth high up in the antrum. At the time of operation he had great difficulty in getting the tooth loose, as it was very firmly imbedded. He took a chisel and pried it out and the tooth disappeared; it could not be found anywhere. He thought it might have been swallowed, but what she complained of was that her nose had become blocked. The following day she could not breathe through the side of the nose which she was operated on. On the third day an examination was made, some adrenalin being introduced, and there was the tooth in the inferior meatus. The interesting part was that between the nose and the cyst was the antrum; he had opened the antrum, and while there was a little blood in the antrum the tooth was not there, but had gone through the antrum into the nose.

In another case there was a cyst of the inferior maxilla. The patient was a little girl, and there was a tumor on the side of the face which was an adenomatous affair. That cyst was treated in a similar manner, with perfect recovery. Usually there is great danger of weakening the jaw, as the cyst absorbed the bone, and spontaneous fractures had resulted as a consequence. As a rule, more teeth were distorted in a cyst which was high up, and the teeth were usually not teeth but remnants of teeth.

DR. OTTO FREER described a dental cyst which he removed in 1913. The patient was a young woman of eighteen. For a year a swelling had been growing under the right half of the upper lip and under the right half of the nose, uplifting it. Examination showed a cyst which uplifted the nasal floor in the region of the premaxillary bone and lay above the right incisor and cuspid teeth of the upper jaw. Pressing upon the cyst caused fluctuation in the mouth in the gingivolabial fold. The diagnosis was a dental cyst originating from the roots of the right upper first bicuspid tooth which had been devitalized and crowned. An incision along the right gingivolabial fold exposed the thin walled cyst, which was dissected out from this cut upward into the nasal cavity. The cyst was removed entirely, although very frail and adherent to its surroundings. Care was taken not to seize the cyst in the dissection but only its surroundings, and in this manner rupture was avoided. Inspection of the bed of the cyst showed that soft as the cyst was it had created absorption of the right premaxillary bone and of the incisor crest under the cartilaginous septum. This left the anterior inferior border of the cartilaginous septum without support or attachment, so that it sprang into the right external nostril and had to be removed by a resection to clear this naris. The result was perfect breathing and the disappearance of all deformity.

DR. H. L. POLLOCK stated that all the teeth he had seen had no fangs but simply a crown of the tooth. In pictures they appeared as if imbedded in the orbit, but taken stereoscopically this was shown not to be the case. In one patient, a boy of eighteen, the third molar had not erupted, so it might be taken for granted that it was an interrupted molar on that side. The case was to be operated in the same way Dr. Beck had described, and he thought there would be no recurrence if the burr was used so as to be sure to remove all mucous membrane.

DR. GEORGE PAULL MARQUIS was very glad Dr. Beck brought out the point about the burr. His experience had agreed entirely with that of Dr. Beck's as regarded recurrences and in the future he would certainly use this method. He thought the cases really were divided into two groups, from the anatomic situation: those which lie anterior to the first

bicuspid and those which were posterior. Those anteriorly situated were the ones which caused almost no trouble; it was a very simple proposition to eradicate those cysts. Those which lie posteriorly were more closely in association with the antrum and would cause more trouble; it was in those cases where the antrum was most likely to be involved and one would have to open into it.

DR. JOSEPH BECK said the advantage of the burr was that one could get down to the mucous membrane of the antrum without entering the antrum. He would consider it a failure in the technic if he got into the antrum. In the case in which he opened the antrum he did not pack with wax, but treated it as an open wound and subsequently used bismuth injections and got a complete recovery.

As to the congenital side of the question, he had X-ray plates of a father and daughter who had dentigerous cysts. He operated the father fourteen years before the daughter. In looking over the work of Killian, he spoke of the dentigerous cysts in the nasal cavity, and one of the earliest cases he reported was such a cyst which went into the nasal cavity and included it.

Replying to a question from Dr. Frank, Dr. Beck said that recurrences usually were noted two or three months after the closure.

DR. IRA FRANK, closing, said his patient had been free from recurrence for about a year. The cyst in his case was removed by making an incision on the buccal surface of the superior maxilla, similar to that employed in the radical antrum operation. The mass was exposed and incised, after removing the teeth, which were firmly imbedded, and the cyst was easily shelled out.

Paper: The Intranasal Operation for the Relief of Chronic Dacryocystitis.*

BY CARL F. BOOKWALTER, M. D.

DISCUSSION.

DR. FRANK BRAWLEY stated that he had done some of these operations, and the modification he had made was to use the

*See page 982.

burr instead of the chisel, which made a less cumbersome and more rapid operation, and it was equally effective in removing plenty of bone. He thought it was an operation which there was not much opportunity to do. He had found it somewhat difficult to persuade a private patient that it was the operation he should have done. He believed the use of the burr was an improvement.

DR. JOSEPH C. BECK said he had done about fifteen of the operations by the various methods suggested, the Yankauer first. He had seen his operation and brought home his instruments and persuaded a friend to let him operate on a case he had been probing. In this method he pried off the inferior turbinate with the curved hooks. That case was a failure, as was every other case he had done. In adopting the upper avenue a very small wound through the slit was necessary, and they used the Hollow modification of the operation, trying to line the cavity so there would be no raw surfaces. It had been their experience that in using the sounds after the operation the parts had contracted down and there was the same trouble. He thought the principal point in Dr. Bookwalter's paper was the wide cut, and he felt that he had not paid enough attention to that. He would try this method in any future cases. It seemed rational to drop the bottom out of the sac, pack and let it drain through the nose.

DR. ROBERT H. GOOD said the pain could be relieved entirely by putting cocain into the sac and then injecting novocain around the sac. He had exhibited a patient about six months ago in which he did the combined West and Yankauer operation. He chiseled away the bony wall of the duct and sac, and then slit up the nasal duct and sac all the way, and the result was perfect. He thought if the bony wall was taken away and a good opening made in the sac, some day the duct might open up by itself and functionate because of the bony wall having been removed. Yankauer's point of relieving the pressure on the lower end of the duct by removing the nasal side of the bony wall was a very important one and should not be lost sight of.

DR. H. R. BOETTCHER stated that he and Dr. Woodruff had five cases in which they incised the outer wall and took a burr

and burred through and then sewed it up again. The immediate results were fine, and two did fairly well, but the rest closed up again.

DR. BOOKWALTER, closing, said he had not had much experience with the burr, but had used the chisel to remove the bone. He should like to try the burr, not because he could do any better work, but the sound of hammering was disagreeable to the patient.

As to anesthesia, he had used cocain and novocain, injecting novocain into and around the sac, and while he spoke of pain, the patients had never groaned or cried out with pain. They always had **morphin beforehand**.

He thought the opening into the nose must be made large; quite a little of the nasal process must be removed. There should be a window in the mucous membrane just about the same size as the permanent opening was intended to be. The only instrument he ever passed through the canaliculus was the smallest probe. It acted as a guide as it came into the nose.

He considered the after-treatment very important. The patient should be seen two or three times the first week, twice the next week, once the following week, and kept under observation for several weeks. He had cases that had been operated upon from one to three years ago who were perfectly well and where he could demonstrate the opening with edges that had remained exactly the same for at least a year. He considered these cured, but of course there might be recurrences even after that. He had not had any recurrence of supuration, and it would be four years in January since the first operation was done. He had had some with tearing, where there had been a slitting of the canaliculus or previous injury to it, but if the canaliculus were uninjured there was no tearing after the operation. He had done several of the operations at the Eye and Ear Infirmary and the rest in clinical and private practice.

SOCIETY PROCEEDINGS.

NEW YORK OTOLOGICAL SOCIETY.

Meeting of January, 1917.

Acute Hemorrhagic Otitis Media.

DR. EAGLETON said he wished to report a case which he imagined was more common than they realized, and yet he had never seen such a case nor heard of it. It was a case of acute hemorrhagic otitis media, causing acute necrosis of the mastoid with metastatic thrombi in different parts of the brain and a general meningitis, followed by a general sepsis and death in four days. The reason he thought these cases were not described was because they might have been overlooked, and the case had been questionable as to whether it was in reality an ear case.

The patient was a man who looked to be about seventy years of age, but whose age was given as fifty-six when admitted to the City Hospital on December 21st.

In the history given by his wife, she stated that the patient was perfectly well, had never had an earache or discharging ear, until four days from admission, when he returned from work with a severe pain in the left ear. This continued to grow worse, and he became irrational during that night. The following day he was unconscious and had remained so since. Two days before admission to the hospital he had repeated chills.

When seen at the City Hospital the man was in deep coma. There was a hemiplegia of the left side, involving the arm, leg and face. Involuntary movements of the right side of the body, a strong bilateral deviation of the eyes to the right, a slight nystagmus; haziness of the right cornea from exposure had prevented an ophthalmoscopic examination of the fundus, but the left fundus showed a slight papilledema. The left drum membrane was not intensively red, but had lost its color, and the whole posterior quadrant was hanging down as in mastoid. A paracentesis was followed by a large quantity of

bloody serum. Following the paracentesis Dr. Eagleton was of the opinion that the main trouble was the result of the general sepsis and not of the ear trouble.

Cerebrospinal fluid examination showed fluid under pressure, slight amount, cloudy and full of bacteria, almost like a culture tube. Dr. Harrison Martland said it was probably a pneumococci, although certain strands looked as if it might be a streptococci mucosus capsulatus, or a pneumococcic infection.

The man died on the night of the paracentesis, on the fourth day from the beginning of his illness. Examination of the head showed between the arachnoid and dura a large amount of pus, differing from the ordinary cases, in that the pus was not alone in the subarachnoid spaces, but was free in the subdural space. The pus was present in such quantities that one could wipe it away with a knife.

Scattered through the substance of the brain were many areas of encephalitis from the deposit of infective thrombi, these areas being surrounded by an area of edema. In the internal capsule of the right side there was a rather large area of encephalitis from an infective thrombus. The cerebellum showed numerous hemorrhages into its cortex, such as is seen in sepsis from a suppurative endocarditis.

The left mastoid was blackish from acute necrosis, with hemorrhagic infiltration of the substance of the bone and of the mucous membrane. The middle ear was full of clots, which may have been the result of the paracentesis that occurred only a few hours before. The walls of the mastoid were full of a gelatinous serum, as seen in very rapid sepsis.

A complete postmortem was made of all parts. There was a purulent bronchitis, and lungs giving no evidence of pneumonia. The heart was normal. The stomach had undergone antemortem digestion of the mucous membrane.

The interesting point of the case was that following the acute otitis media there resulted an acute necrosis of the region around the middle ear and mastoid, followed immediately by infective thrombi in the terminal vessels of the brain and a purulent meningitis. Then followed of course general sepsis. The case was important because Dr. Eagleton thought that they were probably more common than had been realized. Dr.

Harrison Martland had stated that he was very positive that this was a case of primary infection of the ear of mucosus capsulatus.

DISCUSSION.

DR. PHILLIPS said, regarding Dr. Eagleton's patient, that he could not say he ever had a case with exactly the same history, but had seen cases of very rapidly developing meningitis, with fatal results in from two to five days. He thought it was a pretty rare condition.

DR. DENCH said that he had never seen, so far as he remembered, a case of streptococcus capsulatus infection complicating a hemorrhagic mastoiditis. He saw a number of cases of hemorrhagic mastoiditis—from three to four each year—but he did not remember a single case of this character in which the infecting organism was a streptococcus capsulatus. Cases of mild otitis media with fatal meningitis are not uncommon. He remembered a case of this kind occurring at St. Luke's Hospital several years ago, in which the middle ear symptoms were very slight, amounting to simple congestion along the periphery of the drum membrane and along the hand of the malleus. The patient had a high temperature on admission, and was operated on as an emergency case the next day. The patient died immediately after operation. This case was not a case of hemorrhagic mastoiditis, however. He had always considered that here the middle ear infection and the meningeal infection were concomitant and not interdependent. The speaker had seen a number of cases of streptococcus capsulatus meningitis, but these had always been insidious in their onset. He remembered one case of extensive mastoiditis, not of the hemorrhagic variety, with a sinus thrombosis necessitating removal of the internal jugular vein. This patient was about to leave the hospital at the end of three or four weeks after the operation, when, without warning, he suddenly developed a high temperature and became unconscious. Streptococcus capsulatus was found in the spinal fluid, and this patient died less than forty-eight hours after the onset of his meningitis symptoms. This was probably a case where the organism had become encapsulated and suddenly, as the result of some unknown cause, had been liberated into the cerebro-spinal lymph space. Reasoning from analogy, one might think

that infection of the meninges would occur more frequently with the hemorrhagic variety of mastoiditis than with any other variety, as a small tributary vessel might easily become occluded by a clot and this clot might extend backward toward the meninges and cause infection.

DR. HASKIN asked if there was a cephalitis in this case.

DR. EAGLETON said that in the postmortem examination one could see areas where infective thrombi had lodged in different parts of the brain in the internal capsule. There was a hemiplegia of the same side, and, of course, if the man had lived long enough, he would have had an abscess. The infective thrombi was the point of discussion—as to whether an infection could begin in the morning and that night a patient become irrational, followed the next day by coma. It was an interesting point—whether the vessel had been plugged by infective thrombi. If the patient had lived long enough there would have been multiple abscesses of the brain. This was practically in contradistinction to what Koerner had stated, that all these cases were by direct extension. The speaker was sure, from postmortem experience, that direct extension to the brain, in brain abscesses, was a very rare thing. An abscess generally results from a retrograde thrombosis. Of course, we have extradural, intradural and intracerebral abscesses. Both extradural and intradural abscesses were by direct extension, but a large proportion of intracerebral abscesses were from retrograde thrombosis, the result of the plugging of a vessel.

DR. BERENS asked if there had been anything about this man, in the postmortem examination, that could possibly have been thought mastoid and brain symptoms, which could have come from metastasis. Dr. Eagleton had spoken about the stomach being predigested. The speaker asked if there was any focus in the body one could have gotten metastasis from.

DR. EAGLETON said that Dr. Martland thought that predigestion of the stomach wall was not an uncommon thing.

DR. HASKIN asked what the condition of the pancreas had been. This condition, in diseases of the pancreas, was very apt to occur. The fluids of the pancreas, escaping into the peritoneal cavity, caused this necrosis.

DR. EAGLETON said the pancreas had been examined, but he had no notes of its condition.

DR. HASKIN said he could not see from the blood current how one got metastatic conditions in brain abscess from the lateral sinus, which goes out of the skull and not into the brain.

DR. EAGLETON said that at the tegmen tympani there were a number of small vessels, any one of which might become thrombosed. The peeled vessels of the cortex had free anastomosis one with another, so that if a retrograde thrombosis reached the cortex, it caused no nutritional disturbance; but when the vessels in the substance of the brain became thrombosed, they being terminal, from nutritional disturbance, necrosis resulted and an abscess formed. Of course, abscesses that were extradural were by direct extension, but in those inside the brain substance, as he had opened it, the brain looked perfectly normal.

DR. Eagleton said why he happened to speak of this case was because of the rapid death, and it showed that if the man had lived long enough he would have had brain abscesses.

DR. HASKIN said he did not see how extension could come there through the blood vessels of the tympanum. This was distinctly separate from the brain, and the blood vessels went into the lateral sinus from the petrous sinus. The speaker asked how one was going to get direct extension through this. He said one might probably get an embolus there, but not a thrombosis.

DR. EAGLETON said they did not want to speak of embolus, but of vesicular occlusion, which is caused there from a thrombosis or embolus. This frequently happened in filled veins.

Closure of Old Mastoid Wound.

DR. PHILLIPS said this case was rather new to him, although he thought that the primary part of the work was common and had been performed by all men in this line of work. The patient, a man, had a very deep sulcus, following an acute mastoid, and instead of the granulations coming out toward the surface, the skin had crept inward. The man had a very deep depression, and a smaller, deeper hole in the antrum region, but no communication with the middle ear.

He came to Dr. Phillips to ascertain if he could get rid of

this cavity in his mastoid process, and the speaker told him that it could be done. Over a year previously the mastoid operation had been performed in California, and the bismuth paste was used a few days after the operation and healing had taken place. The patient said there was a discharge for a long time, and he had seen particles of the paste coming out, and was quite positive a good deal had come away.

In attempting to get to the bottom of the old wound, and in order to elevate the skin, Dr. Phillips had unavoidably entered the mastoid antrum. He had a good opportunity to study an antrum following the use of the bismuth paste. As a matter of fact, there was no solid material found, and the cavity was filled with what appeared almost like a membranous material that had no particular significance. The wound being apparently sterile, he used the blood clot, allowing the wound to fill full of blood then stitched it up.

The subsequent history of the case was the interesting part. When the patient came out of the ether he began to expectorate blood quite freely—not an enormous amount. This continuously for about four days. Knowing that this blood came from the antrum by way of the eustachian tube, Dr. Phillips had feared it would serve as a pathway of infection to the old wound. The drum had remained intact, but was dark colored for several days. The wound healed promptly, and there is now absolutely no depression behind the ear. Two months had elapsed since the operation.

DISCUSSION.

DR. HARRIS said he saw a very remarkable X-ray picture, which Dr. Law had shown him. The man came into the clinic with a diagnosis of fracture of the skull with a swelling over the occiput. He was sent to the radiographer for a picture. Dr. Law said the man had told him that when he blew his nose the swelling at the back of the head bellied out. Dr. Law made him out as a candidate for a lunatic asylum, but when he saw the man's picture he thought the man was nearer the truth. There was a remarkable development of the frontal sinuses and ethmoidal cells. There was a completely pneumatic mastoid, posterior and anterior, directly back to the occiput. It was perfectly possible that when the man blew

his nose he filled the eustachian tubes and antrum, and through these cells he was able to extend or distend the swelling.

DR. PHILLIPS said that for two or three days afterwards the drum looked a little bit congested, but it never broke down. The man now heard as well as he did before.

DR. HASKIN said he had seen the patient to which Dr. Harris referred, at the hospital. The swelling was as big as a fist, and it sometimes took forty-eight hours for it to disappear. It ballooned out on blowing the nose hard, but when Dr. Law first asked him to see the patient, he thought it was an angioma. The patient had very thick dense hair, and the fracture of his skull had taken place in childhood, about seven or eight years previously. It was rather remarkable that he did not get an infection. It was interesting to know what would happen if the cells became involved.

DR. DENCH said that in regard to the plastic operation reported by Dr. Phillips, he had used this method on several occasions where it had been necessary to operate for an unhealed mastoid wound, and that he had obtained excellent results. He did not consider, however, that they were true blood clot cases. He believed that the good result was obtained by the obliteration of the operative cavity by approximation of the edges of the wound, rather than by filling the cavity with a blood clot and allowing this to organize.

Dr. Christian R. Holmes, in an article read before the International Otological Congress in Boston, had made a very valuable suggestion in regard to the treatment of all cases of mastoiditis, and that was, that the periosteum should be sutured separately in these cases. If the periosteum is first sutured and then the superficial wound closed, and pressure is made over the wound, the soft tissues sink into the cavity resulting from the operation and obliterate this. In this way all dead spaces are done away with, prompt healing takes place, and there is a minimum amount of deformity. This form of procedure is really a modification of the procedure suggested by Dr. George Leland, who advised that in the mastoid operation a flap of periosteum should be tucked down into the antrum, thus closing off this area. In none of these cases spoken of by Dr. Dench was the wound closed completely. A small drain was placed in the lower angle of the

wound, and this was rapidly shortened at successive dressings. The method was really one of obliteration and not of filling it with a blood clot and allowing this to organize.

Mastoid With Acetonuria.

DR. PHILLIPS said he had a case under his care, in a child, that began with an attack of grip six weeks previously. The patient was taken ill with a cold, and very fortunately the physician attending her was a watchful man, who commenced to examine the urine. He found the child had an acetonuria, which he had great difficulty in getting under control. Both ears began to suppurate after two weeks. The doctor had succeeded only a few days previously in getting the urine in proper condition, and then only by using enormous doses of bicarbonate of soda in high enemas. Finally, on the Sunday previous, the mastoid had become so much involved that Dr. Phillips was obliged to operate. There was at that time a temperature of 103° , and the operation was followed by a re-appearance of the acetonuria. The struggle again commenced, getting the child in proper condition. It was a staphylococcus aureus infection.

Bilateral Abducens Paralysis.

DR. DENCH said that he would like to ask how many of the gentlemen had seen cases of bilateral abducens paralysis. He had seen two such cases within the last two weeks. In one case a radical operation with a subtemporal decompression had been done at another hospital. When the patient was seen the entire radical cavity had become obliterated by the sinking of the intracranial structures into the middle ear. The operation was difficult on account of this sinking of the intracranial structures, but by careful dissection the overlying soft tissues were separated from the dura, and then, by means of a brain retractor, the dura and its contained structures were elevated and the radical cavity was cleaned. In the course of a few days the abducens paralysis upon each side was very much better. The patient had had considerable vertigo, but this disappeared rapidly after operation. The spinal Wassermann reaction in this case was negative. Two weeks later Dr. Dench saw the second case of double abducens paralysis, with facial paralysis upon one side. This patient had simply a mild acute

otitis media on the side of the facial paralysis. In this case, also, the spinal Wassermann was negative. While the first case would be explained as a symptom of increased intracranial pressure, the second case did not allow of this explanation.

DISCUSSION.

DR. HARRIS said that Dr. Dench's case suggested one he had seen only a few days previously, which was equally puzzling, and that was one where the abducens paralysis was on the side of the opposite ear, and none on the affected ear side.

DR. HASKIN said they had a case at the Manhattan Eye, Ear and Throat Hospital with a double abducens paralysis. This man had always had trouble on one side. There was recently a diagnosis of some central lesion in his condition of bilateral paralysis. He had had paralysis on one side since childhood, but the other had come on within six months.

DR. DENCH said that his explanation was that in the first case there was probably a low grade of meningitis, and that the decompression operation relieved the pressure upon both sides. This would explain the improvement in his first case. A year ago he had reported a case before the American Otological Society, in which an abducens paralysis appeared suddenly following a mastoid operation with exposure of the dura. Here a larger exposure of dura, with elevation of the dura from the superior aspect of the petrous pyramid, caused a cessation of pain and a disappearance of the paralysis. These two cases were easily explainable, either as the result of a localized meningitis at the base of the skull, which accounted for the paralysis on one side, while increased cranial pressure might so crowd the cranial contents of the opposite side as to cause paralysis of the opposite abducens. The abducens nerve runs for a considerable distance in the skull quite unprotected, and for this reason is extremely liable to be interfered with, either from inflammatory exudate or from pressure due to increased intracranial pressure. Double cases could easily be explained by a broad neoplasm involving the nerves at the base of the skull, but there was no evidence of any neoplasm in either of his cases of double abducens paralysis. The second case of double abducens paralysis, complicated by a mild otitis media upon one side, admitted of no explanation as far as he knew.

DR. EAGLETON said that a double abducens paralysis was a very common thing in brain tumors. He said that an explanation of the double abductor paralysis in brain tumors is that from the internal hydrocephalus the sixth nerve is pressed against the internal carotid, and so paralyzed. The sixth nerve had quite a long course.

DR. HASKIN said that the sixth nerve would be in the cavernous sinus at this point.

DR. DENCH said that two or three years ago he had a case which showed that there was pressure upon the right vestibular nerve. At autopsy a cyst was found on the left side of the cerebellum which, by pressure, crowded the adjacent structures over to the right side, compressing the eighth nerve against the margin of the auditory foramen, thus accounting for the involvement of the right vestibular nerve.

DR. HASKIN said that the sixth nerve pierces the dura half an inch below the petrous ridge on the back of the sphenoid, enters the inferior petrosal sinus and passes through the dura into the cavernous sinus, where it lies on the outer side of the carotid artery. He said the third and fourth also lie on the outer side of the cavernous, but go over the top of the petrous ridge. The nerves lie on the outer side of the carotid artery, and Dr. Haskin did not see how pressure could be brought on the carotid at that point. It was more apt to be where it pierces the dura and enters the inferior petrosal sinus.

DR. DENCH said that abducens paralysis was very easily demonstrated, while the fourth nerve paralysis was not so easily demonstrated. Moreover, the sixth nerve runs for a considerable distance in the cranial cavity unprotected, while the course of the third and fourth nerves is comparatively short before entering the cavernous sinus. Owing to its unprotected position and its long course, the sixth nerve is particularly susceptible to pressure. Moreover, the blood supply of the sixth nerve is very limited, and an occlusion of its nutrient vessel might easily cause either impairment or complete abolition of its function. In the case already mentioned and reported by Dr. Dench at the last meeting of the American Otological Society, the paralysis seemed to be due to an inflammatory process spreading from the area of dura exposed at the time of the mastoid operation along the basal dura, thus

involving the sixth nerve in the exudate or interfering with its blood supply. This inflammatory exudate also involved the dura covering the gasserian ganglion, and from this involvement the patient had excruciating pain over the distribution of the fifth nerve. As soon as these adhesions were broken up the sixth nerve paralysis disappeared, and the trigeminal neuralgia also disappeared. Not a drop of pus was evacuated during the operation, showing that the hypothesis regarding the involvement of these nerve structures in inflammatory exudate was correct.

Furunculosis With Capsulatus Infection.

DR. HOPKINS said that two or three weeks previously, at the Eye and Ear Infirmary, a man had a furunculosis which had been there two or three weeks at the time the case came under particular observation. He had a smear taken, which showed the streptococcus capsulatus. The speaker said this was an entirely unusual condition for furunculosis, and the diagnosis of mastoiditis, made by Dr. Perkins, was endorsed, although there was no mastoid tenderness and no other indication of mastoid condition. The case fell to Dr. Hopkins to operate, and he opened the mastoid, which he found absolutely free from inflammatory conditions, being normal throughout, until he came to the antrum, which, when opened, showed blood welling up from the antrum very rapidly, indicating that the middle ear was filled with granulation tissue. Although no pus was found, the smear taken showed a streptococcus capsulatus infection. The speaker thought it one of those cases which would suggest that some of the rapid cases of capsulatus infection of the brain might be due to such a condition, the bone itself not involved, but the capsulatus infection spreading through the middle ear into the brain tissue.

DISCUSSION.

DR. DENCH asked if a blood culture had been made in that case.

DR. HASKIN asked if a radiograph was taken of that case. He said he asked that question of Dr. Law, who had shown

him a plate and asked him what he thought of it. It looked as if the whole mastoid on one side might be full of granulations and inflamed, although no area of pus could be seen. The case was one of very intense dermatitis with a great deal of edema and swelling over the back of the mastoid. Dr. Law and Dr. Rae had the case radiographed just to see what one would get in such an edematous condition. It was a picture with nearly every indication of mastoiditis, except that the middle ear was apparently normal. There had been no evidence of inflammatory condition in the ear. The thing all subsided under local applications. A radiograph taken later showed an absolutely clear mastoid. To all appearances the first would have made one think the whole area was involved.

DR. BERENS asked if the thickened condition on the outside was due to the furuncle in Dr. Haskin's case.

DR. HASKIN said there was in his case no furuncle of any sort.

DR. DENCH asked if in Dr. Haskin's case the outline of the mastoid cells came out clearly, and if the mastoid was opened.

DR. HASKIN said the mastoid cells were there and looked rather hazy, as though they were thickened. The mastoid was not opened. They took another plate, which showed absolutely as clear as the other side, after treatment.

DR. DENCH said that he had seen radiographs of a good many cases of severe acute otitis media. In any severe acute otitis media the mastoid cells would appear cloudy. Subsequent plates would show a clearing of the acute inflammatory process and the septa of the mastoid cells would come out perfectly. Ordinarily he looked upon a radiograph as a very good measure for determining whether or not the mastoid cells were involved sufficiently to demand operation in cases of acute otitis media complicated by a furunculosis. A series of plates taken at intervals in such a case would show a gradual clearing up of the mastoid infiltration, in spite of the edema behind the ear due to the furunculosis. If the mastoid cells still remained cloudy, it was pretty certain that the operator had to deal with a mastoiditis as well as with a furunculosis.

DR. HASKIN said one would not expect a mastoiditis to clear up within four or five days, as in this X-ray plate.

DR. DENCH said one plate might have been good and the other a bad plate. One would have to have a tremendous amount of skin infiltration to hide the cells in the mastoid. He could not understand how it would occur in an adult type. They probably had a poor plate in the first case and a good one in the second.

NEW YORK OTOLOGICAL SOCIETY.

Meeting of March, 1917.

Presentation of Specimens.

DR. JOHN R. PAGE: The specimens shown were taken from a child two years old, which had been admitted to the hospital with a brief history. Two days before admission she was taken to the Presbyterian Hospital, with a high temperature, and was referred from that hospital to the Manhattan Eye, Ear and Throat Hospital, where a double myringotomy was done by the house staff. The child was admitted to the ward for examination and ran a temperature not higher than 100° or 101.5° for three or four days after admission, with quite a profuse discharge. On the fourth day, in the afternoon, the temperature went up to 102.8° .

Dr. Page said he was not at the hospital that afternoon, but saw the child the next day. He advised an operation, which could not be performed then, as the operating room was busy. He called up the next day to ask how the child was, and found that the temperature had come down and stayed down, not going above 101° . As there were a rather large number of operations to be done that day it was suggested that the case go over, and instead of being operated on the fourth day, there was no operation until the seventh day after admission, and probably the ninth day from the beginning of the trouble.

The temperature in the afternoon, just before operation, went to 104° . A double mastoid operation was performed and fairly well involved mastoids were found. A blood culture was taken during the operation. It was reported positive hemolytic streptococcus. The child's temperature then continued high, but after operation it varied between 101° and 103° , never above 103° , for five days. The wounds were very dirty and had a lot of green pus in them. There was exposure of the sinus on one side, which was very small.

Dr. Page thought the child was absorbing this pus through the sinus, and believed that by doing the dressings twice a day it might improve. When this was done the temperature

subsided and stayed between 100° and 101° . On the twelfth day after operation the child had been sitting up in bed, with a temperature fairly low for six days, apparently doing well, and feeding itself, when it suddenly fell over. The patient went into coma that morning at eleven o'clock, with convulsions confined to the face, right arm and leg, spasmodic in type, lasting about two and one-half minutes, every ten minutes. The left pupil was dilated, the right smaller, but both were irregular. There was a double ankle clonus and Babinski, but no Kernig. The stomach and intestines were dilated. There were convulsive seizures three or four hours later, limited to the upper extremities. The child remained in coma, with a paralysis toward the end. There was a right hemiplegia, with occasional twitching of the arms and face. Death occurred on March 20th, three days after the sudden seizure.

The autopsy report by Dr. Dwyer showed a large tortuous vein through the dura, and large subdural hemorrhage on the upper left vertex, involving motor centers, a large extensive superficial necrosis and extensive edema of the right front part of the brain, invading motor centers. Markedly free from any thickenings of sinuses, either ethmoids, frontals or sphenoid. There was no clot or any signs of macroscopic infiltration. The inner wall of the left sinus was the same as the right; it was somewhat thicker than normal, but showed no clot. There was a small area of bronchial pneumonia of the right lower lobe. The brain areas were quite necrotic.

Dr. Dwyer said the condition was purely hematogenous. He could trace no extension from the mastoid.

DISCUSSION.

DR. DUEL said he thought this a very important case, illustrating a fact which they all probably knew very well, but which was being more and more impressed upon them, that it was perfectly possible to get a streptococcus infection in the blood stream through an area in the sinus, without the formation of a clot and subsequent breaking down of the clot. Dr. Duel said perhaps some of the members would recall that six or seven years ago he had presented to the society a series of charts from the Babies' Hospital, pointing very pertinently to the fact that a widely vacillating temperature in the presence

of a mastoiditis or middle ear suppuration, was not always associated with a sinus thrombosis.

Since that time he had had a great many puzzling cases in which there had been great doubt about the question of operation. Many of them had recovered without operation. He thought that there was often a grave question as to whether these cases were actually showing an infection which might or might not be due to a sinus thrombosis. In the absence of a demonstrable bacteremia it was a question as to whether it was not more advisable to isolate the infected area from the general circulation, even though a thrombosis was not evident.

DR. DENCH said, in speaking on Dr. Ducl's remarks, that he had in one case been inclined to take the view advanced by Dr. Holt. In this case Dr. Holt had been wrong, as the temperature was due to a mastoiditis complicated by a sinus thrombosis. Despite adverse opinion he had operated on this case twelve hours after he saw the patient, and found the mastoid full of pus. The temperature fell immediately after opening the mastoid, but later rose again, and the sinus was exposed. The sinus contained a clot. The temperature again fell after the removal of the clot, but inside of twelve hours rose again, and the internal jugular vein was excised. The vein contained a clot extending throughout its entire course. The child subsequently died of gangrene.

Speaking of other cases in which the sinus was involved, Dr. Dench pointed out that a parietal clot was the most dangerous condition to be found in the sinus. In one case showing signs of sinus thrombosis he had operated, and the sinus bled very profusely. Notwithstanding this the internal jugular was excised, the temperature immediately fell, and the boy made a complete recovery. A clot in the lateral sinus is an effort on the part of nature to shut off the focus of infection from the general circulation. When a clot breaks down we have symptoms of pyemia with localized foci of infection in the various viscera—that is, in the lungs, liver, spleen, heart, brain or intestines. The only chance of saving many of these cases is to cut off the primary focus of suppuration from the general circulation by prompt excision of the internal jugular vein. In many of the cases thus treated no demonstrable clot

will be found, either in the vein or sinus. The wall of the vein and sinus, however, will be found to be infiltrated with pathogenic organisms. The infective process, in other words, extends from the local focus of suppuration in the bone to the wall either of the sinus or the jugular bulb, and then infection travels through the wall of the sinus until it affects the inner wall, with the formation of a parietal clot. In all cases the infiltration of the vessel wall extends beyond the limit of any demonstrable clot. Of course, the excision of both jugulars, when indicated, is naturally a very grave condition, as the cerebral circulation is apt to be greatly disturbed.

Operators should always remember that when a small area of sinus is exposed, this area should be intentionally increased until at least three-fourths of an inch of the vessel wall is exposed. With a small area of exposure the outside wall of the sinus would become infected through the infected field, no matter how carefully instrumentation is carried out. As a result of this local infection the sinus wall swells, and the circulation in the wall is interfered with by this swelling. The infection then travels to the internal wall of the vessel, giving rise to general systemic infection. If, on the other hand, a large area of sinus wall is exposed, the circulation in the vessel wall is not interfered with by swelling of the wall of the vessel. The vessels of the sinus are able to take care of this local infection, and no general infection results.

DR. EAGLETON said the case he had presented at the last meeting was very similar to Dr. Page's case. The whole thing went through in four days, practically the same as this case. They were realizing that processes could be as rapid as that, and in forty-eight hours his patient, a man, was in complete coma.

DR. PAGE said, in regard to exposure of the sinus, that exposure of the sinus had been made simply because the inner plate was cracked in one place and he feared something would get under the crack. It was widened so that there would be no retention.

Presentation of X-Ray Plates.

Presented by Dr. Haskin.

DR. HASKIN said he would like to pass around two or three plates. At the last meeting they had spoken of a case of pneu-

matic condition of the mastoid, and he thought it might be interesting to look at its development. The man had had a fracture of the skull when he was a child, having fallen on his head. He was now about eighteen years old and had a tumor at the back of the head, which could be felt on palpation, and when he blew his nose hard it would be enlarged. After this it took about forty-eight hours to go down again. They were not sure whether it was angioma, and inserted a large needle, getting an expression of air through the tube.

The second plate showed a peculiar form of microtia in a child ten years of age. The position of the lobe of the ear was down in the middle of his cheek. There was no development of the upper ramus and the condyle of the jaw on that side. There was a tremendous glenoid fossa. The teeth were in the process of the bone, but had never erupted. The X-ray picture showed a petrous bone, but no formation of a mastoid, and what was taken to be the superior semicircular canal could be seen. In the question of hearing, with the noise apparatus in the sound ear the patient undoubtedly could distinguish the difference between a loud ringing fork and whistle or voice, but that was all. There was absolutely no functioning static labyrinth, and it was merely of interest from the standpoint of atresia. Another was in a girl twenty-two years of age. There appeared to be no mastoid process back of the cells, but the canal seemed to be normal, except that at about one-half of its depth it was blocked off. There was no membrane in it at all, and no hearing whatever in that ear. She had measles when six years old and had never had any hearing. There was no development of the mastoid, and this was somewhat similar to the microtic case. This woman had a perfectly normal auricle but no ear. The third case was a man, twenty-eight years of age, with microtia.

Case With High Temperature.

DR. HASKIN showed a plate, which he said was interesting, because in the case Dr. Law had said the left mastoid was clear. The right mastoid showed involvement and sclerosis of the superior walls. The woman had an operation on the left mastoid seven years previously. Dr. Law was quite astonished and said it could not have been so. The woman had

some deep cells away down between the canal wall and the sinus, and some over the antrum and knee of the sinus. The sinus stood out wonderfully clear. Dr. Law did not think there was any diseased condition in the mastoid, but on operation a very decided involvement was found. He thought it was nothing but a normal mastoid, but it had been very extensively excavated seven years previously. The subsequent history, Dr. Haskin said, was the most remarkable of any case he had had to deal with for a great number of years. The patient from earliest girlhood had been going to hospitals. She had been operated on for appendicitis, for tonsils and adenoids, a submucous operation, and then another submucous operation, which was unsuccessful. Within two hours after the last operation she complained of intense pain. The house surgeon attempted to do a paracentesis four times. She was then transferred to Dr. Haskin by Dr. Harris. The speaker looked at her drum membrane, which was red. He incised the drum membrane, but found no pus at the time. The intense pain kept on for three or four days after the last paracentesis was done. Finally he operated on the mastoid and found it extensively involved. After elevating the skin and soft tissues, an area of black granulation tissue was exposed, extending down into the antrum. The dura was slightly exposed over the tegmen of the antrum. He cleaned out all the walls from the knee of the antrum and took out the tip, which was full of new bone, which had formed from the previous operation. Before, the surface had simply been taken off without the deep tip cells. None of the cells which Dr. Law spoke of were involved. They curetted the region between the sinus and canal wall and finally uncovered three or four perfectly large sized cells.

The patient was put back to bed with no sutures, and they expected the pain to be relieved, but it was not at all. She could not be touched anywhere over the head without pain. Dr. Haskin presented her temperature chart to the society, taken during the time she remained in the hospital, and a report of what was done for her. She had a negative Wassermann reaction. Both cerebral, spinal and blood cultures were negative. The complement fixation test for tuberculosis, negative. Four blood cultures had been taken which were all

typhoid and paratyphoid were all negative, likewise the reflexes and eye grounds. The abdominal reflexes were slightly increased.

Dr. Haskin said they had watched her very anxiously, and finally the family were so anxious to have something done that they took her away. Meanwhile the wound was healing up very nicely. She went away from the hospital on February 25th and came back on March 6th with severe pain. The interne who examined her said the physical examination was negative. They thought of meningitis after the high temperature. After she had been in the hospital from the sixth to the eighth, the temperature began to go up suddenly. It went up to 104°, 105°, 106°, 107° and 107-2/5° and then dropped back to 106°, when she left the hospital. There was absolutely nothing found to account for it. Dr. Rae and Dr. Friesner went over her and tried to find out what it was.

They did not do a lumbar puncture until the day she left the hospital finally. Ten cubic centimeters of perfectly sterile fluid were withdrawn and a normal saline reintroduced. With this high temperature the pulse rate was only 72 and 68, and then up to 78. This was a very low pulse rate, the speaker said, for that temperature. Five days after the operation on the mastoid she developed a partial facial paralysis. She could close her eyes, but there was a partial paralysis. The most interesting thing was that they took the girl away with a temperature of 106°. She was taken to the Neurological Institute, and Dr. Haskin presented the temperature chart taken during her stay there. In the Neurological Institute the temperature was normal and had been normal ever since admittance.

DISCUSSION.

DR. DENCH said that in a case of neurasthenia the eighth nerve might be involved, giving rise to severe pain, and in neurasthenic cases high temperatures, not explained by any known cause, were not uncommon. He remembered one case occurring in St. Luke's Hospital in 1885, where a patient would occasionally shoot a temperature of 106° and 107° for no assignable cause. The patient made a perfect recovery, and in this case no aural lesion was present. The diagnosis in the

case of a neurasthenic could only be made by elimination. Practically no dependence could be placed upon the symptoms complained of by the patient. If any focal suppurative lesion were present, naturally the surgeon was greatly concerned. In the absence, however, of any positive results on cytologic examination, the mere presence of temperature alone in a neurasthenic should not be sufficient cause for operation. With normal blood and normal spinal fluid in such a case, the temperature should not cause undue alarm.

DR. HASKIN said he had brought the case up because he thought Dr. Rae would be present, who wanted to report the same kind of a case. When they did the mastoid the temperature began to run down. The lumbar puncture showed a sterile fluid. They had to give her one-half grain of morphin every three or four hours. In his case they did a decompression and also later explored the brain, and found nothing. The patient died, and they found a localized basal meningitis.

Another such case, Dr. Haskin said, which Dr. Dench might recall, had been presented by Dr. Packard before the Eastern Section of the Triological Society, entitled "An Error in Diagnosis." The patient was watched and everything had been done. They did a mastoid, a decompression, explored the brain, and nothing relieved the pain. There was a sterile cerebral spinal fluid, and the patient died. Miliary tubercular meningitis was found at the base of the brain only. In this case they had been absolutely puzzled and could find nothing at all except pain and temperature. Dr. Rae's case was exactly the same, and when he was asked whether the case presented should be operated upon, he said to leave it alone, as his case had happened two weeks previously. His patient had died with an entirely localized basal meningitis, and yet the cerebral spinal fluid was absolutely negative, both with chemical and bacteriologic tests.

Personally Dr. Haskin felt that his patient, the girl, had a localized basal meningitis, and it would be interesting to know the outcome.

He said his patient did not sleep, and Dr. Elsberg said they could only keep her quiet by giving her morphin. They gave her one-half grain of morphin at six o'clock, and another at four in the morning. She yelled so that everybody was dis-

turbed, and yet during the day she was fairly comfortable. She had pain in the day but did not yell.

DR. DENCH mentioned in this connection a case seen in consultation, in which a very good radical operation had been performed. The patient complained of uncontrollable headaches. The Wassermann blood and spinal reactions were negative. The question came up whether a decompression operation would be of benefit. Dr. Dench did not advise the decompression, but said that he would perform the operation if no condition could be found which would account for the pain. The patient was sent to the family physician, who knew the family history. He administered antiluetic medication. The patient made a complete recovery, the pain disappearing absolutely. The family physician knew in this case there was a positive luetic history in the family.

DR. HASKIN said no lumbar puncture was done until one day before she left the hospital, but after the lumbar puncture she still suffered intense pain. The temperature dropped down to 102°, but when she left the hospital it shot up to 106°. Dr. Haskin said he did not think it at all impossible that the lumbar puncture was a source of relief and that the patient got sufficient relief after drawing off that amount of spinal fluid, which lightened up whatever was irritating the heat center, and in this way might have relieved the temperature.

Bilateral Abducens Paralysis.

DR. PERKINS said that at the last meeting of the society the subject of bilateral abducens paralysis from brain tumors arose, and Dr. Eagleton had given Cushing's explanation, as due to distention from accumulation of cerebrospinal fluid in the descending horn of the lateral ventricles, pressing upon the nerve as it passed between the cavernous sinus wall and the carotid artery. Dr. Haskin could not understand how this could take place without the third nerve being involved at the same time. Dr. Perkins said he had made several dissections on cadaver, and after doing them it came out perfectly plain. The internal carotid artery got into the cavernous sinus at the foramen lacerum medium, turned anteriorly and then made another turn upward, at the same time approaching the medium line. The sixth nerve is in immediate relation with it and

the wall externally, so that pressure here would bring the horizontal part of the artery and external wall of the cavernous sinus still nearer together, thus resulting in interference with the function of the nerve—that is, abducens paralysis. The third nerve enters the cavernous sinus from above and does not come into such intimate relation with the artery, lying, as it does, in a much wider part of the sinus.

DISCUSSION.

DR. HASKIN said that the sixth nerve went below, into the inferior petrosal sinus, and then passed up. The third nerve passed over the ridge of the superior petrosal and lies in the cavernous sinus. The sixth passed underneath the ridge of the petrous, whereas the third goes over the superior border of the petrous. He said he still did not see how pressure on the carotid artery would cause the paralysis, and thought it was due to pressure before entering the sinus.

DR. PERKINS said that Dr. Haskin had claimed that the third nerve must necessarily be involved, and that the explanation given accounted for the escape of the third nerve. Dr. Perkins said the carotid artery could not be called a soft substance, compared with the nerve. It is a well known fact that slight swelling of adjacent tissues producing very little pressure on the sixth nerve causes abducens paralysis. The pressure exercised by an artery may be very great in its effects—for instance, the absorption of bone from aneurism. The vulnerability of nerves from pressure of arteries is strikingly shown in some cases of paralysis of the recurrent laryngeal.

DR. HASKIN said he also had made some sections which showed the third, fourth, fifth and sixth nerves where they pierce the dura and their course in the sinus itself.

ABSTRACT OF THE SCIENTIFIC PROCEEDINGS OF
THE THIRTY-NINTH ANNUAL CONGRESS
OF THE AMERICAN LARYNGOLOGICAL
ASSOCIATION.

HELD AT ATLANTIC CITY, NEW JERSEY, MAY 28, 29, 30, 1917.

EMIL MAYER, M. D., ABSTRACT EDITOR,
NEW YORK.

The president, Joseph L. Goodale, after expressing his appreciation of the honor conferred on him, said:

This year we meet at a time when the thoughts of all are centered upon our entrance into the great war. Aside from the fact that lesions of the upper air passages are especially frequent in the present war, both from the character of the missiles and from the use of asphyxiating gases, observers have noted a great increase in inflammations of the nose and throat spread by contagion among the numerous masses of men in modern trenches.

The contributory causes are the prolonged stay in the trenches, the dampness and want of ventilation in the dugouts, together with the defective light, in which the virulence of microorganisms is increased, or at least the bactericidal influence of sunlight and fresh air is absent. These conditions appear to favor not only the spread of acute catarrhal infections, but also of cerebrospinal meningitis. The importance of stamping out foci of this latter disease has suggested the desirability of examining recruits with reference to the possibility of their being carriers through lodgment of the meningococcus on the mucous membranes of their nasopharynx. Disinfection of the mucous membranes of carriers has been successfully accomplished by placing the individual in a chamber containing a certain percentage of chloramine vapor for a few minutes. The procedure is said to cause but slight irritation to the mucous membranes, but seems to have almost a selective action on the microorganisms in question.

Some sections of the line appear to be especially unhygienic, and numerous cases occur of infection which in ordinary life are rare, such as perichondritis of the larynx and primary laryngeal tuberculosis. Latent systemic disease is prone to be lighted up—such as tuberculosis and syphilis. Bleeding from the nose, trachea and bronchi, at times of an alarming extent, often occur. In albuminuria, fatigue and cold are apt to bring on glomerulonephritis, a not infrequent symptom of which is edema of the glottis. The unfavorable influences are increased by the difficulty of changing clothing, transportation in open vehicles, and by rapid changes of temperature.

Direct laryngoscopy has proved its value in locating traumatic lesions.

Secondly, may we not then profit by an examination of the writings of those who are now endeavoring to indicate some of the errors of judgment and conduct in matters of education and research?

In illustration of past deficiencies in this respect may be cited the fact that for many months the English authorities, while rigorously excluding from Germany such articles as saltpeter and cotton, nevertheless were permitting the exportation of lard from this country in large quantities, in ignorance that it is the source of glycerin, and consequently a prime requisite in the manufacture of explosives.

We must, therefore, recognize that as nations court destruction for want of science, so our profession in America runs the risk of being outstripped by that of other countries unless it rests upon an equally secure foundation of scientific training with all that this implies.

Another matter which I wish to present for your consideration is the slackening up of scientific work in allied countries in the early part of the war.

We should differentiate between those educators and investigators, on the one hand, whose position permits an advantageous deflection of their activities into channels capable of rendering a direct national service, and on the other those individuals who, by reason of their age, lack of physical qualifications, or from the nature of their work, may regretfully feel that they must stand aside without a definite service to offer.

Such men are capable of making a very real contribution to the nation. It is for them to uphold the best traditions of their past, to maintain without faltering their customary work of teaching and investigating, and to present to their comrades whose good fortune it may have been to participate more directly in military service, on the return of peace, a definite record of having kept undimmed each in his own chosen field the light of education and of research.

Further Observations Upon the Use of Radium in Diseases of the Upper Air Passages.

By D. BRYSON DELAVAN, M. D.,
NEW YORK.

From a report by Dr. Ewing and Dr. Janeway of the Memorial Hospital in New York City, an institution devoted to the study of cancer, the writer presents a summary of one hundred and eighty-four cases of cancer of the upper air passages out of a total of four hundred and twenty-two cases.

The successful cases given in the report of cancer of the mucous membranes are illustrative of the best service that radium in the light of our present knowledge can perform. In the majority of them the lesion was small and probably operable, but for some reason operation was deemed inadvisable or was refused. While all show complete clinical retrogression, this—from the point of view of those who only consider as cured those patients who are well after three to five years—may not be an absolute cure. The proof must be left to time.

In advanced cancer, any temporary benefit from radium is usually overshadowed by the later progressive extension of the disease. No patient of this class should be given treatment which will be followed by more than transitory discomfort.

To summarize a few after-points made in the report which seem to carry special weight:

Knowledge of the use of radium is making steady progress.

The work of but one year in a single institution shows a marked advance.

As with surgery as applied to carcinoma, so with radium, for the best results are gained by the prompt treatment of early cases.

The question at once arises as to how long it will be before the use of radium will be proved worthy to supplant surgery.

DISCUSSION.

DR. CHARLES W. RICHARDSON, Washington, D. C.: I have had very unfortunate results after the use of radium in five cases which I recall to mind—four of cancer of the tonsil, and one of cancer of the cheek. They have all died. The cancer of the cheek was discovered very early.

Now, these and the other two cases, which were later, all died in the usual course of time.

There is, however, one thing to be said in favor of radium in the treatment of these cases, and that is the wonderful relief it gives of all of the disagreeable symptoms. As they went along their course these cases did not look like extensive malignant disease of the tonsils, as we usually see them. There was very little odor and the lives of the patients were fairly comfortable and free from pain. One died from hemorrhage, and the other three from toxemia, and this toxemia came on one week and the next week they passed away. It was all very quick, and they were apparently in good health except for the local condition. Until the time of toxemia they were interesting in that way, that they were all very much more comfortable, but they all four were fatal, and fatal in about the time they would have been without any treatment at all.

DR. ROBERT CLYDE LYNCH, New Orleans: I have four cases in my experience now, one of which I believe is definitely well. It is a case that has apparently been cured—at least the patient has had no recurrence for eighteen months. He received no benefit at all from the action of the radium until the radium was put in the laryngeal cavity through a tracheotomy tube. Seventy-five milligrams of radium and screened over with a milligram of pure gum rubber was left in situ for eight hours, tied into the larynx by means of a catheter, and put in through a tracheotomy tube passed through the mouth, the radium slung between two strings, the lower string tied to the tracheotomy tube and the upper string to the teeth. In that way the radium was brought into actual contact with the diseased tissue. This was one of the cases that had a recurrence after dissection by suspension, and that recurrence has

entirely subsided and the voice returned, and he is apparently well—that is, he has been well for eighteen months at least.

In another case operated upon with a third recurrence it was thought to be perfectly inoperable, and the application of radium to this area caused perfect and complete subsidence of every evidence of the recurrence. It is now six months since this application, and apparently there is not the slightest indication of any recurrence of this metastasis to the second side. In this instance again we were able to supply the radium actually to the site involved, and I wonder whether inability to secure any results in the laryngeal areas is not due to the fact that the cartilage must act as an interceptor to some of the rays, or influence the action of the radium within the laryngeal box.

DR. E. FLETCHER INGALLS, Chicago: A patient came to me from a distant state with a growth in the pharynx running perpendicularly. It was about one and a half centimeters in its various diameters and about three or four centimeters long; that is, it extended from the upper pharynx down to the arytenoid cartilages. I could not tell how much farther. The patient came with a history of not having been able to swallow for some time, and was much emaciated and in an extreme condition. The effect of radium in this case was something marvelous; the growth simply melted away. At the end of about eight days the tumor had all disappeared, but there was a large ulcerated surface that represented the base of the growth; and the most remarkable thing was that the ulcerated surface completely healed so that within a short time one could not even see the scar. When this growth had disappeared I found that the patient still could not swallow, and then I was able to determine that she had cancer of the esophagus lower down. I passed a catheter down to the obstructed point, measuring the distance, and then placed his radium in the catheter and measuring the distance passed it down into the stricture. The result of the first application was to open up the stricture very decidedly, and a later application opened it up so that the patient could swallow very well. However, in one of the earlier applications the throat was burned so that it had the appearance as though it had been burned with boiling water or a hot iron. It became very sore and there was considerable

sloughing. The patient had a great deal of discomfort for ten or twelve days; however, the burn finally healed.

DR. J. PAYSON CLARK, Boston: I want to add my testimony to what Dr. Richardson said in regard to the value of radium treatment in relieving the symptoms, especially the symptoms of pain. I was very much impressed with the relief which was obtained in swallowing by patients who had before suffered a great deal.

DR. LEWIS A. COFFIN, New York City: I have had a little experience in the last year with radium. I had become thoroughly discouraged in its use and the effects from it. However, we are glad to get anything that adds a ray of hope to forlorn cases.

In one of my cases all the symptoms were very much relieved. The woman could not swallow at all when she came to me, and shortly afterward she was eating fairly and greatly relieved. But the glands softened up somewhat, and we thought it well to open those glands and let out the broken down tissue and put the radium in those glands and left it there all night. The woman, however, began to lose ground and she soon died.

Another patient had a growth in the epiglottis, and a pathologic examination showed it to be malignant. In that particular case it was just like adding manure to soil: the growth was very much stimulated and it grew more rapidly than if we had not used radium.

DR. BURT R. SHURLY, Detroit: I am enthusiastic enough in the use of radium to feel that it is our duty to at least use this method of treatment in all cases of malignancy where we so thoroughly understand that surgical methods are not sufficient to accomplish results.

I operated on one case which involved the soft palate, the upper jaw and the antrum from time to time—three operations in all—and after each operation there has been a very slow recurrence. During the past three years we have used radium at intervals of from three to six months, and the radium has been passed up into the antrum after the antrum operation and held there by the use of soft pliable copper wire which will bend in any direction.

Another case that I have had which has now been going on for about three years. By a series of applications of radium his case has undoubtedly been prolonged and been benefited, and what looked to be a very speedy fatal issue has turned out to be a slow process that has now continued for three years.

I do believe that radium has a very decided field of usefulness, but there is a great deal in the scientific application of it, and in the dosage and method by which it is applied, and I feel that it is a field within itself, and we should have an expert who will help us in that branch of the work and upon whom we can call at any time.

DR. EMIL MAYER, New York City: I would like to have the reader of the paper in closing give us some statement as to what class of cases have done best. It is very possible that we may innocently do some harm to the patient in our attempts at making a diagnosis. Ought we not, therefore, learn of the experience of those who have followed these cases and found that perhaps it may be that those cases have done best where the diagnosis has been made clinically, and no previous attempt made to remove a part of the growth for microscopic examination to prove the diagnosis? Is it not possible that that stimulates the recurrence of the disease? If we can have that made clear, it does seem that we may be able here to formulate some positive distinct rule as to the method we may adopt with safety.

DR. HARMON SMITH, New York City: I believe the good results that are obtained from the application of radium lies in the fact that practically all tumor growths vary in their virulency, and that those cases which are benefited by radium are less virulent than those cases which go on in their natural process of malignancy to a fatal termination.

I am associated with the same institution as Dr. Delavan, and I have sent a number of inoperable cases there—patients upon whom I had previously done a tracheotomy. This is an institution where every facility is available for properly applying radium in advanced cases, and each case went progressively on to death. In addition to these cases, I have sent two cases of retrolaryngeal fibroma, and one went on to death. In the other case there was such burning and excoriation of

the mouth that we had to feed the man by rectum for a week, and instead of retarding the growth, it became accelerated and involved the cheek. This was an angiofibroma.

DR. NORVAL H. PIERCE, Chicago: Based upon his experience the speaker believes that while a growth may show the characteristics of carcinoma under the microscope, it may vary greatly in malignancy.

At the present time there must be an enormous number of these cases, and I cannot see that we have arrived at any particularly well defined opinion regarding the beneficial effects of radium, even at the present time. I can only state that my experience with radium has been in a broad sense disappointing.

Within the past two years I have had three cases of carcinoma of the superior maxilla involving the antrum, and without exception they have gone from bad to worse, although every means of applying radium has been followed, even to perforating the antral wall and putting a capsule of radium immediately into the growth. True, the pain has been diminished and the odor has decreased, but the disease has swept on as though nothing had been done.

I believe that if we depend upon radium for a cure in the early stages of laryngeal carcinoma, we will have about as much effect beneficially or otherwise, in the large majority of cases, as we would have if we depended upon faith. We only waste time.

I have had a case recently in which we split the larynx and applied the radium without cutting away the growth, a case of leucoplakia laryngis, where I had observed the patient for four years. This leucoplakia was situated on both vocal cords. The leucoplakia remained unchanged for four years. Suddenly from one of these plaques on the right vocal cord, the posterior third, a swelling began—a fusiform swelling covered by mucous membrane—and a well marked cauliflower-like carcinoma developed. The larynx became very much inflamed, and the last I heard of him was that there was a probable recurrence of the growth.

The only possible chance for cases of carcinoma of the larynx is thorough removal by external means at a very early date, no matter how early. Whether we apply radium or not

is immaterial; otherwise in extensive carcinoma the only means of safety is a thorough operation, and by that I mean laryngectomy.

DR. JAMES E. LOGAN, Kansas City: I believe if the suspension method is used and a local application of the galvanic cautery is made directly to the growth, comprehending or taking in all of the growth so far as is feasible, that we will have accomplished practically all that we could accomplish, if not more, than in an application of radium.

If we are to judge from the literature pertaining to the subject, there appears to be very little if anything in the use of radium for such cases.

DR. JOSEPH BECK, Chicago: It is about fourteen years since I started the employment of what I thought was radium in diseases of the upper respiratory tract, and only about five or six years ago did I find out (and then reported with negative results) that practically no radium was contained in the capsule that I was employing. So far as I am able to learn from the literature on the subject, too little radium was employed, and then when an amount, say one hundred and fifty to two hundred milligrams, was left in situ for a period, it burned the structures beyond repair, so that the remedy was worse than the disease. My results are absolutely negative as to cures of deep seated growths; I will not even say of far advanced cases, but of those which I would ordinarily class as operable. When radium was employed in such cases the ultimate result was either laryngectomy in time to save the patient, or a fatality.

If Dr. Mayer would have us treat cases without touching the growth, it does not seem to me it would add anything. We will not know what we are treating. This does not appeal to me. If we do not have microscopic examinations of the growths we are treating, it seems to me the subject would not advance very far.

DR. D. BRYSON DELAVAN, New York City (closing the discussion): The work which is being done at the Memorial Hospital in New York is very far in advance of anything that I know of that has been done anywhere else, and for that reason I have taken the liberty of presenting this résumé of that work.

In this report I mentioned, the hospital gives you the results of its work along this line. It is the best they have been able to do in three years' time with a very considerable number of cases. When more years have passed they will have thousands of cases, but their attitude in treating these patients is purely experimental—time will give more definite results, or at least more conclusive results, whether better or worse.

Of all the cases treated, there are a total of twenty-two which are believed to have fairly retrogressed. That means twelve per cent of the one hundred and eighty-four cases. There are also seventy-nine cases which have improved, which is a total of about forty-three per cent. There are also seventy-nine cases unimproved. This makes a total of fifty-five per cent supposed to be improved, as against forty-three per cent unimproved. In cancer of the esophagus, stomach, etc., the statistics are just about the same.

The method must be adapted to the case, and the ingenuity of the one managing the case must play an important part in the selection of the means of application.

The device of Dr. Robert Abbe is simple, ingenious, and very effective. It is intended for the application of radium to the more remote recesses of the body, and is especially useful in the larynx and pharynx. It can also be introduced in any part of the upper nasal cavity, which is extremely difficult to reach by any other method.

There is another thing which has come to be used in the treatment with radium, and that is an obturator like a plate for artificial teeth, extending backward to the site of the growth and furnished with grooves in which the radium can be placed to the location desired.

As to the hopelessness of cancer of the throat—it is pretty hopeless. The cases all die. We do not get the true statistics of surgery of the larynx. You cannot get them—no one will give them to you; but if you should get them, you would have a pretty ghastly record. Perhaps it might, therefore, be just as well to exercise a little patience toward radium until we find out what it can do, and look forward with a ray of hope meanwhile to cheer the men who are working very hard to perfect it.

**An Endolaryngeal Removal of an Unusually Large Lymphoangioma
From the Larynx, With Complete Recovery of the Patient.**

BY CHARLES W. RICHARDSON, M. D.,

WASHINGTON, D. C.

As is well known, this type of growth is very unusual and rare in the larynx, lymph angioma being rarer than the typical angioma. This growth presented a gross appearance, of a large bluish, mottled mass in the supracordal portion of the larynx, having its attachment on the right side from the false cord, the aryepiglottidean extending over to and covering the false cord on the opposite side. This was removed by endolaryngeal method, the writer having first tested the fact that it was not a hemorrhagic growth. On removal by puncture, it had a soft pultaceous feel and exuded a syrupy bloody fluid. It was five centimeters in length, three and a half centimeters in breadth, and two and one-half centimeters in depth. The pathologic investigation demonstrated it to be a true lymph angioma.

The paper deals with the method of operating in these cases, and also calls attention to the fact that this is the forty-second case of angioma, and its modifications, which have been found in the larynx.

DISCUSSION.

DR. J. M. INGERSOLL, Cleveland: I had the privilege of seeing this case before it was operated upon, and was very much interested in the report.

I think that it took considerable courage for Dr. Richardson to determine whether or not the growth was an angioma by incising it. I discussed the case with him then, and we both wondered what the outcome would be, and were suspicious of malignancy. I never had seen anything like it before. The end result is very favorable.

DR. EMIL MAYER, New York City: These cases are especially interesting. One particularly important thing is that the trained eye of the laryngologist sees at once that the diagnosis that is so often made in nearly every one of those cases is wrong, and that the cases are not of a malignant nature. I can picture for myself the view that Dr. Richardson had of

that patient, with a proper light, where he at once concluded that the original diagnosis of malignant disease which had been made was wrong. I believe that we can in most instances make a diagnosis microscopically.

I must congratulate Dr. Richardson on his courage in putting in a knife to see if it was a bleeding tumor, and also on his successful removal of it intralaryngeally. The growth itself differs from most of the others on record, in that it was partially external and partially within the larynx. It is very remarkable that a patient with so large a growth should be able to get along without a great deal of dyspnea. To my mind a case of this kind would be ideal for suspension. With very little effort one could draw the growth into a snare and remove it, and if necessary cauterize the place. In the case I reported a year ago the operation was done externally, and the growth was removed and the mucous membrane sewed over. I am confident that that was the only way the case could have been treated, for the reason that it was below the false cord and not above it.

DR. HENRY L. SWAIN, New Haven: Some of those present may recall a case in which I removed a tumor in the same manner as Dr. Richardson did, the report of which appeared in the Transactions for 1892. This growth, however, was lower down than it was in the case of Dr. Richardson, and it still holds the record for size in strictly intrinsic growths of the larynx. The growth was in the anterior commissure, and began only slightly above the place where the two cords come together, so that more of the base of the tumor was below than above. When the patient came into my office one could see nothing but the growth upon expiration, but during inspiration this tumor would move down so that the air could get by it. The patient had been living in that way with a very hoarse voice and with difficulty in breathing for nearly two months. He ran for a trolley car and fell down and was nearly asphyxiated, and relating that to me as I looked down into his larynx, I trembled at the idea of getting the tumor out. I had no idea of the up and down dimensions of the tumor; the diameter as I looked down upon it was just what would fill the chink of the glottis, but the vertical dimensions were three times the horizontal dimensions. I told the man that if

he was a good soldier I would try to take it out. He consented and I put cocain in, and taking a snare got a good hold of the tumor twice. I tried to get the tumor out but failed. The man was getting blue in the face, but I put on a whole lot of power and got it out. I was more scared when it was finally out than I was before. It was a tremendous growth, much larger than was apparent to the eye, and still holds the record for size. I was prepared for the eventuality of hemorrhage, and told the man to throw himself forward with his head down, hanging over the end of the couch. He minded exactly as he was told, and hardly a drop of blood came away. He came back again on the third day and one could see then where it had been, just above the vocal cord. The patient had no recurrence. Dr. Richardson's specimen is a monster and the result of his skill is most gratifying.

DR. CHARLES W. RICHARDSON (closing the discussion): I wish to add just one word to Dr. Ingersoll's remarks, a point which he did not make quite clear. We were a little suspicious of the malignancy of this growth—in fact, we could not quite eliminate the matter from our minds—before we had the result of the pathologic findings.

Report of a Case of Carcinoma of the Larynx Treated With Radium.

By ARTHUR W. WATSON, M. D.,

PHILADELPHIA.

A physician, about seventy-three years of age, came under my care November 24, 1914. There had been increasing hoarseness for a year, without inflammatory symptoms, pain or cough; the general health was good, the general history was negative.

Examination of the larynx showed a smooth, red, sessile growth or swelling on the left side beneath the vocal cord, extending from the anterior commissure backward about one-half the length of the cord, and downward from the cord about one-half inch. It seemed to involve the under surface of the cord. Movement of the anterior half of the cord was restricted, which caused bowing in phonation. The growth was sharply defined and the other parts of the larynx appeared to be healthy. A clinical diagnosis of carcinoma (epithelioma)

was made. For obvious reasons a microscopic examination was not made.

When first seen the growth was one that could, undoubtedly, have been removed by laryngofissure, but in consideration of the age of the patient and the fact that he was in favor of trying the effect of X-ray or radium, it was decided not to operate.

The radium was applied to the outside of the larynx; eleven milligrams radium, filtration one millimeter of lead and one and one-half inches of gauze, for three hours. This was repeated in February (six treatments, 198 milligram hours). March 1st the radium was increased to twenty milligrams, filtration one milligram lead, one-half inch gauze, applied for three hours. This was repeated (six times, 360 Mg. hours). March 17th began forty milligrams radium, filtration same as before, applied for three hours. Repeated (six times, 720 Mg. hours).

Various applications were made, none of them satisfactory, and it had to be abandoned. The external application of the radium again instituted in the following dosage. Forty milligrams radium, filtration one millimeter lead and one-half inch gauze, applied five hours July and August (in all nineteen applications, 4200 Mg. hours).

September 23rd, about one month after discontinuing the radium, it was noted that the growth was apparently gone, left vocal cord a little slower in movement than the right, skin inflamed over larynx.

On the second of April, 1917, the patient returned with hoarseness, which he had noticed for a month or more. Examination showed a small nodule beneath the edge of the left vocal cord near the anterior commissure, the site of the old trouble. Radium was again used, a few days later, forty milligrams, for twelve hours. The larynx was examined two weeks later. The growth was found to be smaller, the neck inflamed. April 25th, only a slight thickening remained. The voice was again almost normal. The same condition was present when last examined.

From the results that I have seen in suitable cases, and with a better knowledge of the dosage, better results may be ex-

pected, especially if the radium can be applied from within the larynx, which would be made easier by a tracheotomy.

DISCUSSION.

DR. ROBERT C. MYLES, New York City: It is a question to be solved, whether in the early stages of incipient cancer it is best to immediately remove the cancerous mass with the adjacent tissues, and if it recurs to use radium, or whether it is best to use radium without microscopic examination. In this connection it would seem best to consider to what extent we would advocate either procedure if the growth was in ourselves. Judging from personal experience and observation, it is my belief that the average person who has a growth, or symptoms of a growth that is probably malignant, defers the question because they do not like to have it decided that they have one, and hope against hope that nothing will be found. There is unnecessary delay caused by that attitude of mind.

As far as the secondary or tertiary conditions of cancer are concerned, it seems to me to be unwise not to use radium for the hope it offers in the relief of pain and odor and the other phenomena connected with malignancy.

I think it was Dr. Mayer who made the remark earlier in the morning that we should first try to cure the patient and leave the scientific diagnosis unsettled. On the other hand, this is not conducive to progress; again, I do not know whether we can improve the physical conditions of a case which experience has shown us is malignant, by microscopic examination, nor do I see what the chances are of it being nonmalignant by resorting to such examination.

DR. HENRY L. SWAIN, New Haven: I am very glad that we have heard this paper, first because it was a model in the way it presented the dosage, method of treatment, length of treatment, etc., and secondly because it left us with a spirit of hopefulness.

This is again a case of the old, old story. We went through all this with the X-ray. We had in our hands a powerful means the possibilities of which we knew nothing, and we learned by exchanging experiences in the various meetings all over the country that X-ray burns were produced, that we must use a filter, that we had to have adequate dosage, if we

were going to get results. We are now doing the selfsame thing with radium. In exchanging these experiences now, it seems as if we ought to come to some conclusions. I think one thing is clear—that we should not putter around with other means, and if we are going to use radium, we should get at it early. Inadequate dosage is worse than nothing. On the other hand, we must not use such a tremendous dosage that we either kill the patient or the surrounding tissues.

DR. E. FLETCHER INGALS, Chicago: I am under the impression that the dosage here is quite as important as in giving strychnin; that is, if you give too large a dose it will do a great deal more harm than if nothing had been given. If we read the reports of the men who have used radium, we will find that there has been in some cases great destruction of tissue from which some patients have finally died. Some patients can tolerate larger doses than others. It appears to me that radium, X-rays and sun's rays act practically in the same way: they burn in every direction where they can reach, unless properly screened. All the weaker tissues burn out first; but if the dose is a little too strong, the normal tissues will burn out at the same time. If this is correct, then the dosage is by far the most important thing; it must be worked out carefully. I tested each individual patient—a small dose at first, and repeated, according to its effects.

DR. ARTHUR W. WATSON, Philadelphia (closing the discussion): What I wished to bring out was the question of dosage. I am of the opinion that if the dosage is too heavy, so that the normal tissues around the growth are destroyed, cicatricial tissue is produced in which the malignant disease may more readily be reproduced. It seems to me that this may be the reason for failure to cure the disease in some cases. But I believe the best way of getting at the proper dose is by regarding what has been done in each case, instead of considering one application of radium the same as another.

Tuberculoma of the Tongue.

By CARL E. MUNGER, M. D.,
WATERBURY, CONNECTICUT.

Male, aged thirty years. The patient's tongue presented a crater-like cavity situated on the dorsum, at the junction of the middle and posterior thirds, in the median line, the prebase of the tongue. At the bottom of the crater was a marked ulceration covered with a yellowish slimy secretion, and from the central ulceration were narrow sharply marked ulcerations radiating to the circumference of the thickened and indurated mass. The surface of the swollen mass was yellowish in color, and there was marked and exquisite tenderness upon the slightest pressure, with much pain at every movement of the tongue. This pain was localized and not radiating when the tongue was at rest. There was present also the condition known as nigrities.

While the tubercular ulcer may be primary or secondary, a primary tubercular lesion of the tongue is extremely rare; although a few cases of tubercular infection of the tongue following traumatism have been reported. Speaking generally, the tongue is more often inoculated from the lungs than the lungs or larynx from the tongue.

The case reported presented a marked deviation from the usually reported situation of tubercular lesions on the tongue, which have almost invariably been stated to occur either on the tip or sides, this one being on the dorsum, a site on which we usually find a gumma.

The prognosis is not dependent upon the lesion itself, but is influenced alone by the fact as to whether the patient is suffering from concurrent lesions in other parts of the body which are not susceptible to improvement, or is he suffering from pulmonary tuberculosis, where there is a tendency to fibrosis? If the latter is the case, there is a fair degree of certainty that the tongue lesion may heal without local therapy, but if the pulmonary process is acute, with caseation and necrosis active, there is little chance of the tongue healing.

DISCUSSION.

DR. BURT R. SHURLY, Detroit: In a service of one hundred and fifty beds during the past six years in a tuberculosis hos-

pital, we have had two cases of tuberculous ulcer of the tongue. Both of these occurred in a far advanced condition. I have yet to see, in my experience, a primary tuberculous larynx or a primary tuberculous ulcer of the tongue. Invariably, those cases have shown some other activity somewhere, if it is looked for sufficiently and thoroughly. These two cases suffered the most terrific pain and had progressed so far that there was absolutely no chance of relieving or curing the patients. We simply cauterized the ulcerations and made use of orthoform and other measures for relief, in the hope that they might be able to have a little more comfort and take some nourishment. In all these cases it seems to me that we ought to determine the relative frequency of bacilli. By this means the diagnosis is proved and syphilis is excluded. What seems to me marvelous is that we do not have some ulceration on the tongue, from the fact that the mouth in these advanced cases is absolutely alive with swarms of tubercle bacilli.

DR. THOMAS H. HALSTED, Syracuse: Seventeen years ago I removed the tonsils of a girl of twelve years, which were tuberculous. A year or two afterwards a surgeon removed the cervical glands of the neck, which were tuberculous. Two or three days later she developed a mastoid, and in the course of that developed a localized pachymeningitis. We thought it was tuberculous meningitis and expected her to die, but she recovered. Later on, in the course of two or three years, she developed tuberculosis of the phalanges, and one thumb and one finger were both operated upon by a general surgeon. She then developed tuberculosis of the nasal mucous membrane, which I curetted and applied lactic acid for a number of months. Then she developed a tuberculous ulceration of the alveolus, which must be now four or five years ago. Later, within the past two years, she has developed tuberculosis of the nasal septum, and the tuberculous process has extended so that now it involves the tip of the nose, and it looks as though she will lose the tip of her nose. This girl, during this whole period, has been a seamstress, and is of course living a fearful life, with a great deal of pain in the mouth and tongue, but she is very hopeful for some new means of a cure. She feels that ultimately she will get well. In spite of all the dis-

case processes, we have never been able to discover anything in the lungs. The diagnosis has been made through scrapings and the findings of the bacilli. The very interesting thing about this case is the long duration of the disease and the number of lesions which have developed in various parts of the body.

DR. HARMON SMITH, New York City: I do not think this was a tuberculous ulcer. It was in the median raphe, away from the border of the tongue, where irritation of a tooth would make an ulceration. It was a fertile field and one where tubercle bacilli would grow.

We should not confuse tuberculous fissures of the tongue and tuberculous ulcerations of the tongue with tuberculoma. It was about the location of the taste beakers in the median raphe.

Serial Frozen Sections of the Thorax From a Case of Aneurism of the Aortic Arch.

BY GEORGE FETTEROLF, M. D., AND GEORGE W. NORRIS, M. D.,

PHILADELPHIA.

The main points of interest in this report are as follows:

1. Photographs of the patient obtained at various periods during life showed successive steps in the growth of the protruding mass.
2. Frozen sections were made of a case which had had careful clinical study, and as a result, conditions as they had existed in vivo could be accurately reproduced and deliberately studied after death. Search of the literature reveals the fact that this is the first opportunity of this kind which has arisen and been taken advantage of.
3. The exact site of rupture, and the cause and mode of death, could be determined and depicted with a degree of accuracy, certainty and detail which would be impossible of attainment in an ordinary autopsy.
4. The hydrothorax, the pulmonary atelectasis, and the extreme dyspnea are explained in a manner which by any other method of study would have been much less satisfactory, if at all possible.
5. The last statement is equally true of the anatomic relations. The altered position and general changes in the bron-

chial tree and other thoracic contents are depicted in such a graphic manner as to show to the laryngologist and internist alike what does take place in the presence of such a lesion as this large aneurism. It also suggests what may take place in some of our future clinical cases in the presence of other disturbers of the normal intrathoracic relations.

DISCUSSION.

DR. GREENFIELD SLUDER, St. Louis: The labor in presenting Dr. Fetterolf's material is exceedingly great. We are constantly dealing with disturbances that seem trivial, which, if we bear in mind the relations within the chest, are frequently separated and put into a more serious category. It has been my experience within the past three months to, as it were, pick up two aneurisms of the aorta by virtue of dislocation of the windpipe, recognized in the laryngeal mirror, and a number of times I have outlined the same dislocations within the **mediastinum**, depressions of the windpipe, as a means of recognizing mediastinitis. Sometimes they are not of tubercular origin; more frequently I believe it to be tubercular. In one case that proved exceeding desperate, the infection was a primary tracheitis, going on for a length of time with mediastinitis and depression of the windpipe.

Stereoscopic Roentgenograms of the Head.

By J. M. INGERSOLL, M. D.,

CLEVELAND.

The longer we have used the stereoroentgenograms, the more certainly have we been convinced of their practical value, for they give us definite information in regard to the nose and the nasal accessory sinuses, the brain and many of its blood vessels, the ear and the mastoid, which cannot be obtained in any other way. The size and boundaries of the maxillary and frontal sinuses can be distinctly seen. If there are any septa, tumors or foreign bodies in these cavities, they can be accurately located and defined. The ethmoidal and sphenoidal sinuses overlies each other, and are thus somewhat masked, but their position, relative to each other and the orbit and the other surrounding structures, can be clearly distinguished.

Skill in interpreting the roentgenograms can be more easily acquired by the surgeon than by the roentgenologist, for the surgeon has the decided advantage of being able to verify and correct the findings in the roentgenogram while he is operating. If the surgeon will carefully study the stereoscopic pictures before operating, compare his interpretation of the picture with the condition which he finds in the operation, and then study the picture again after the operation, he will soon acquire great skill in interpreting the stereoscopic plates.

In studying stereoscopic plates they should be examined from both sides. First, put the plates in the stereoscope with the film sides toward the mirrors. This will show the structures as we see them in the operation, with the external parts in the foreground and the deeper structures in the background. Then by reversing the plates in the stereoscope, turning the smooth sides of the plates toward the mirrors, the structures will be seen from the inside of the skull.

The technic for making stereoscopic anteroposterior radiographs through the frontal sinuses is described, as also the technic for making stereoroentgenograms of both mastoids on a single pair of plates.

These plates, when developed, are placed in the stereoscope, with the one having the right eye images in the right light box of the stereoscope, and the one having the left eye images in the left light box. With the glass side of the plates turned toward the mirrors of the stereoscope we view the mastoids from the inside of the skull, while with the film side of the plates placed toward the mirrors we view the mastoids from the outside of the skull.

DISCUSSION.

DR. ROBERT C. MYLES, New York City: Dr. Ingersoll has demonstrated it is much better than most of us believe it to be, and the topographic anatomy is shown better by this method than by any I know.

DR. HANAU W. LOEB, St. Louis: It is really amazing how much more one gets to know about his work by studying one after another of the stereoscopic plates in every case which shows a disposition toward suppuration in any of the sinuses. It makes a man much better, even if he does not find in any

particular case any essential value in the exposure. Taking the whole thing together, he develops an understanding of the subject far beyond what can be obtained by any other method.

The beauty of this work is that you can look at a case from before backward, or behind forward, by simply turning the plate around.

DR. LEWIS A. COFFIN, New York City: I just want to say in regard to the stereoscopic picture that there is no question but that more interest and more knowledge is to be gained from it. We must remember, however, that a doctor often sends a patient in from twenty, forty or fifty miles, and unless he can come down where we have such an apparatus he cannot see the results. There are times, therefore, when he must put up with the other picture, which is more or less helpful. We cannot always have the stereoscopic roentgenograms.

**Lantern Slides Showing Normal and Diseased Sinuses of Children
From One to Fifteen Years of Age.**

BY LEWIS A. COFFIN, M. D.,

NEW YORK.

Dr. Lewis A. Coffin showed a double series of slides from X-ray plates of children's heads from one to fifteen years of age, one series showing normal and the other diseased sinuses. He said that one of the interesting things connected with the getting of the plates was the fact that nearly all the plates showing disease had been obtained from X-raying the heads of children from an eye ward of the Manhattan Eye, Ear and Throat Hospital without selection, that practically any case in that ward showed sinus disease, and he believed that this was strong presumptive evidence of the dependence of many eye conditions on the diseased accessory sinuses.

He called attention to the frequent involvement of the antrum, and stated that in this condition he saw the frequent cause of atrophic rhinitis and practically the universal cause of true ozena.

DISCUSSION.

DR. JAMES E. LOGAN, Kansas City: There is no question in my mind but that sinuitis results in atrophy—that is, the cases are usually preexisting sinuitis cases.

DR. ROBERT C. MYLES, New York City: I have never been able to find anyone who had seen a case which occurred after puberty—that is, anyone in authority. It is essentially a disease of child life. How much of it is retarded development and how much atrophic is another question. The most serious question is, how should we operate on the sinuses of these children; what is the best procedure? That can be developed in the future, I think. In regard to patients who are older, it has been my experience that at any age I get my most brilliant results, with regard to odor and continuance of discharge, by opening the antrum.

DR. J. M. INCERSOLL, Cleveland: I simply wish to ask Dr. Coffin whether these patients were operated upon endonasally or through the canine fossa, and what results were obtained.

It seems to me that we should not consider here the question of atrophic rhinitis. If this is to be a discussion on the origin of atrophic rhinitis, may I ask how it is that the orbital fissure from the anterior half atrophies also in the process? There is no sinus opening into that district.

DR. HENRY L. SWAIN, New Haven: Dr. Coffin has come to us with the most astounding assertions. I understand he has come with the proposition stating that he thinks he has further evidence of the origin of atrophic rhinitis in children. Then he comes forward with the statement that he thinks he can cure odor by opening up the antrum, and in his remarks he presupposes that these diseased antra began in childhood, produces atrophic rhinitis, and continues through years of life. Then he states he cures atrophic rhinitis of at least the odor by opening up the antra. I think those are rather bald statements and would like to hear them commented upon. Personally I have examined his statements and believe he is right.

DR. J. L. GOODALE, Boston: Dr. Coffin will have an opportunity for further elaboration of that point. It is in order for any member to ask questions regarding further information from Dr. Coffin.

DR. HANAU W. LOEB, St. Louis: This so-called purulent rhinitis which was described so well twenty-five years ago or so is exceedingly common, and from the fact that the nasal mucosa is affected, it is easy to understand that any of the sinuses more directly connected with the nose in childhood than in adult life should be similarly affected. If the mucosa of the antra is thickened in an existing case of suppurative rhinitis, it is very natural that it should show on the screen. That explains, to my mind, the reason that in so many of these cases Dr. Coffin was able to find evidence of obscuration of the antral field. However, this is an exceedingly common condition, and as atrophic rhinitis is fairly uncommon, he should explain why it is that so many get well without the production of atrophic rhinitis.

DR. BURT R. SHURLY, Detroit: I should like to ask Dr. Coffin how extensive is the operative procedure following this particular line of invasion.

DR. NORVAL PIERCE, Chicago: I am sure that some of these pictures are misleading. Last winter I had two cases—children ranging from four to six years—where the roentgenologic picture, according to the readings of the roentgenologist and myself, showed anterior disease—in one case bilateral, and in the other case lateral. I washed out three of these antra (in one case I washed it twice), and nothing whatever was washed out. They were quite dry antra. There is no doubt but what they were dry. In the past I have had a similar experience to that, where the discharge from the nose led me to have an X-ray taken, and where the roentgenologist said that the sinuses were undoubtedly diseased, but which were found healthy. So that we must check up these cases of supposed disease of the sinuses by other means than the X-ray.

DR. ROBERT C. LYNCH, New Orleans: Down South we see a number of cases of atrophic rhinitis, and I have two children of the same family, twins, two and a half years old, perfectly well developed cases of atrophic rhinitis. I wonder whether they have lived long enough to go through the period of inflammatory changes to give them atrophy. I do not think they are due to simple sinus disease.

DR. J. M. INGERSOLL, Cleveland (closing the discussion): We get new ideas in regard to the anatomic relations from

the stereoscopic pictures, because we get the three dimensions. In regard to the use of stereoscopic radiographs, I think that unless a man uses them long enough to become familiar with them, and develops some skill in interpreting them, they are liable to stop using the method. If they do study them and check up the findings, I am sure they will become convinced of their value.

Dr. Loeb spoke of the value of reversing the plate. One of the great advantages of the stereoscopic plate is that you can look at it from both sides—that is, you see the structures in the operative field, and also from the inside, which you cannot see in any other way.

Shadows over the accessory cavities in the X-ray, whether stereoscopic or other plates, make one suspicious of involvement of the sinuses of the nose. I regard them simply as one of the confirmatory evidences. They are not positive. There are other things which enter into the causation of the shadows. A sinus which has thickened mucous membrane casts a darker shadow than one with a normal mucous membrane. The variations of the bone structures themselves, or part of the other bones beyond coming into the field, make one sinus appear darker than another. The bones do vary, so that a dark sinus alone, as seen in the plate, should make one only suspicious of that cavity.

DR. LEWIS A. COFFIN, New York City (closing the discussion): Every case of atrophic rhinitis generally brings out something like adenoids and tonsils. Inasmuch as this is so, and that Dr. Loeb stated that it is not a very common or rare disease, I will convince him at least that it is as common as this. If you go in the hospital ward you will find almost all the children show disease of this kind. This does not mean that if you will take them off the street they will show the same percentage. They are simply diseased children.

I had a little patient in the same ward four or five years ago, and she is now ten or eleven years old. She had a keratitis, and had been in the hospital a year. We took out one tooth, both the milk tooth and the one above it, and cleaned up the antrum, and inside of a short time her eyes were open and they have been open ever since. I saw the child and exam-

ined her jaw, and one would not know she had even lost a tooth unless you counted the teeth on the two sides.

Somebody asked the question as to whether these all went on to atrophic rhinitis. I presume not. Some get well; but all the cases shown here are chronic cases.

There are changes in the lining membranes of sinuses that the microscope and pathologists cannot tell us. There are latent sinuitis cases in which the X-ray does not show much. I have operated upon a case and found no free pus and no pockets of pus, but every bit of tissue taken away the pathologist will tell you is just covered with disease. I think it is possible to get some of our worst conditions from latent sinuitis cases. The antrum frequently shows dark under the X-ray; you cannot even get water through, and yet there is no pus. I do not know what the degeneration of that membrane is, but it is **full of polyps**.

In regard to opening up the antrum and getting rid of the odor, because it is just as easy to do this in atrophic cases, go home and try it.

We have had one case in which the odor was as bad as you can think of, and the patient had never been treated for ozena, and nothing had been done but the antrum opened. In some of the cases we purposely left the ethmoids to pustulate and scab, in order to see the scabs without the odor, but the antrum is clear.

The Intranasal Drainage of the Frontal Sinus.

By E. FLETCHER INGALS, M. D.,

CHICAGO.

The writer believes that in a large majority of cases of chronic frontal sinus disease, free drainage is all that is necessary, and that vigorous curettage is a bad practice, although gentle removal of polypi or granulation tissue with a curette, if present, would undoubtedly hasten the cure.

The furor for extensive mutilating operation on the frontal sinus has had its day, and now, more conservative intranasal drainage is a practice that is generally accepted.

The writer's attention was first called to the benefit obtained from intranasal treatment in 1893, when he succeeded in cur-

ing two cases by intranasal treatment, as neither of them would consent to an external operation.

As drainage into the nose was a prerequisite for treatment, the writer devised a burr with a safety guide to be run into the nasofrontal duct so that the duct could be enlarged permanently.

This burr made a canal six millimeters in diameter, which, however, had a tendency to contract. To prevent this latter, a metal tube was inserted into the canal. This metal tube was superseded by the spring-gold self-retaining tube now in use. This may be worn for a number of years and permits free irrigation by the patient.

The writer is convinced that the operation can readily be performed by any properly equipped laryngologist, and has placed the percentage of recovery of suitable cases as high as ninety-five per cent.

The instruments used are described, as also a detailed account of the manner of operating that the speaker has devised.

Further Report on the Intranasal Treatment of Accessory Sinus Diseases.

BY ROBERT CUNNINGHAM MYLES, M. D.,

NEW YORK.

In the past twenty-four years the writer has had much to say concerning the intranasal treatment of accessory sinus diseases. On the fourth Wednesday in January, 1893, twenty-four years ago, he read a paper entitled the "Diagnosis of the Diseases of the Accessory Sinuses and Their Treatment."

On account of the failure to secure uniformly good results, in antral suppuration, he made use of the malar ridge and canine fossa route; and then, after due consideration had been given to the cases, with more or less unsatisfactory results, it was noted that very favorable conditions nearly always followed when the window through the inferior nasomeatal wall was not less than fifteen millimeters in diameter, and never contracted to less than about ten millimeters.

The writer continues to prefer the nasal route to the antral one for operation on the sphenoidal cells, and strongly advocates making large openings in the anterior walls.

Partial success in an attempted submucous and subperiosteal operation on the anterior wall previous to removal of the bony wall, and the utilization of the membranes for covering the lower sections of severed bone, encourages the belief that if this procedure is well carried out it will aid materially in preventing the too frequent closure of the sphenoidal openings.

In the ethmoidal cases the classical operations of removal of the middle turbinal, the floors and the median walls of the cells are carried out.

The progress that has been made in the intranasal treatment of the frontal sinus diseases centers around the methods for making permanent large openings from the nose into the sinuses.

After removal of the anterior end of the middle turbinal and the anterior ethmoidal cells, the writer uses improved designs of his outward cutting chisels for removing as much as is possible of that part of the floor of the sinus which is formed by the nasal process of the superior maxillary bone. These instruments are used with a feeling of safety, as they automatically protect the dangerous areas in this region. Several of the most useful models are presented with this paper for your inspection.

DISCUSSION.

DR. EMIL MAYER, New York City: I would like to make an apology for the abstract editor, and would like to say that what Dr. Ingals complains of was not any garbling of any original paper, but a misstatement on the part of the stenographer of the discussion which was very voluminous on the symposium. The original statement of the stenographer as to Dr. Ingals' standpoint was quite in accord with what he says today. The trouble lay in an attempt, within one hundred and fifty words, to make a description of an operation which omitted some quite vital and important things. I will say this, that I question whether any laryngologist would take an abstracted report in any journal and would attempt to follow any method or description of any operation. He would surely go to the writer of the paper or to the Transactions of the Association, so as to get the correct report. However, all bad things, and this certainly was bad, as Dr. Ingals and I and the rest of you

also will agree, have their good ends, and the good end lies in that we have again the pleasure of hearing from Dr. Ingals just how this intranasal operation is done, and how, after ten years, he finds that the operation is still one that he can recommend to us. So, if you will forgive the abstract editor in part and the stenographer in whole, I think you will agree with me that something has nevertheless been gained.

DR. JOSEPH H. BRYAN, Washington: I have been able to open up the frontal sinus in the living subject, too, but not in all cases. After having gone over the anatomic relations in the cadaver so many times, I have found out that a great many irregularities exist in the accessory sinuses, particularly in regard to the frontal in relation to the ethmoid, and it makes me hesitate when I hear this procedure so ardently recommended as it has been by Dr. Ingals. There must be some difference in the cases that we have been having. I am quite sure that no such method as the doctor recommends can possibly cure such cases as I have had. Now, I have never yet operated on an acute catarrhal or an acute suppurative inflammation of the frontal sinus. I have had considerable experience in this line. All of my cases have been of a severe form of chronic inflammation, lasting a number of years. After going over his papers time and time again, and trying to bring myself to believe that I could follow out the same line of procedure, I have been timid and have gone to the external method, and whenever I have one of these cases I have come to the conclusion that such an operation is not possible to relieve such cases. Now, is it possible in a frontal sinus, with a prolongation extending far into the frontal bone and extending back into the floor of the orbit and into the external angle, by more drainage to cure a case of that kind? Now, in these chronic cases there is nearly always caries of the frontal region, and it is not possible to cut the bone out or cure the condition by simple drainage, which this method is directed to, as I understand it.

In his hands, undoubtedly, the entering of the frontal sinus is practically an easy method, but is it a safe method or an easy method for the average rhinologist? While sometimes it may be very simple for those who are practiced in doing this kind of work, nevertheless, a man must always bear in

mind that he cannot know what there is inside of that sinus without doing the external operation.

DR. HENRY L. SWAIN, New Haven: There are a great many cases where we refuse or hesitate to make an external operation. We are not all as successful as Dr. Bryan in having our operations clean up. Certainly, I think there is a vast field for the procedures of Dr. Ingals in the medium cases, and in the severe cases we will bow to Dr. Bryan. I have had some severe cases, but a lot of cases we could get well by the internal method. This is safe and sane. Dr. Ingals has proposed one to us. I must say I have not done it. I am like Dr. Bryan, afraid to do it, from my knowledge of it from his description alone, even though it is profusely illustrated. I seem to get along with milder means than even Dr. Ingals suggests, but I do get the cases well, and do not have to do the external operation only very rarely.

I have had this winter three cases which anybody would suppose ought to require external operation, where there have been spontaneous external perforations into the orbital cavity, and one where the disease went through the front plate of the frontal sinus on to the forehead. Presumably the process was severe enough to make the bone necrotic. All three got well simply by ordinary curettement of the frontal nasal duct and opening the abscess in the orbit. The bone of the external plate was not touched in any way at all. I have simply had good luck, but it shows the possibilities—that sometimes cases seem severe and yet do not require severe measures. There are three classes of cases—the ones that get well by simple curettement; those that require simple intranasal methods; and occasionally a case that requires the external method.

DR. HANAU W. LOEB, St. Louis: I just want to mention a procedure which Halle published in the past two years which makes all these external operations much easier, and that is to make a flap of the mucous membrane covering the superior maxilla anterior to the middle turbinate. It takes away that thickness of the wall and also permits much more ready access to the frontal sinus.

DR. GEORGE E. SHAMBAUGH, Chicago: The more I see of chronic accessory sinus infection, the more I become convinced that intranasal surgery is the proper treatment for the vast majority of the cases. Most of the cases can be cured by this method, and those which are not completely cured are with very few exceptions relieved of all symptoms which would justify an external operation.

In the case of the maxillary sinus I have found that by working through the nasal fontanelle in the middle meatus one can in a few seconds' time, with suitable instruments, secure an opening one-half by three-quarter inch long and one-half inch broad, which is ample for our purpose. This can be done with local anesthesia with much less shock to the individual than an opening in the inferior meatus. The old idea that an opening in the inferior meatus had an advantage because of its location near the floor of the sinus, does not hold true, thus securing ventilation of the sinus. No irrigation afterward is required.

The frontal sinus is considerably more difficult oftentimes to secure a sufficiently large intranasal opening to permit of free ventilation of the frontal sinus, and for this reason we are able less often by intranasal surgery to bring about a complete cure of chronic frontal sinusitis; but it is the rarest exception for us to find a frontal sinus infection where anything more than intranasal surgery is justified. It has been my belief for a long time that the external operation for the frontal sinus should be a tabooed operation except in the rare cases where, in spite of painstaking, careful intracranial surgery, severe symptoms persist, indicating retention and pressure and threatening intracranial complications.

DR. GREENFIELD SLUDER, St. Louis: I think that when Dr. Bryan takes the stand that there are cases with a ramification of the frontal sinus under the roof of the orbit, out into the external cochlear process of the frontal bone, when it runs back to the lesser wings of the sphenoid and extending more or less swollen beyond with granulation tissue, that case will in all probability not get on by simple drainage. Dr. Roe, if I remember correctly, in 1890, stated that he had deliberately left the antrum in one case filled with granulation tissue, prevented internal drain and left the granulation tissue alone,

and that the case healed. Some five or six years ago I was in a frontal sinus externally and found it not specifically enlarged or ramified, but filled with granulation tissue. The case had been operated by someone else before, and the nasofrontal outlet was blocked in solid bone. There was great headache, and the bone was so healed that it could not be handled from within, so I went into it externally and found the cavity filled with granulation tissue, but put a drain into the nose and that was satisfactory. I left the cavity filled with granulation tissue and that case healed.

I believe that the value of a satisfactory drain for all of these, whether they be frontal, ethmoidal, antral, or sphenoidal, cannot be possibly too greatly exaggerated, but there must still remain a case that requires Dr. Bryan's procedure, that must of necessity justify his ideas concerning these cases. It is difficult to tell how far it really can go. In 1890 I had an antrum that had been suppurating four to five years. The operation that was done was the old Cowper through the alveolar. I kept it open with a plug, I washed it, and in some six months it stopped suppurating. It was always reinfected by coryza and healed with a few washings. The old gentleman died a few years ago. After I learned the intranasal procedure, I offered him that and explained that it was a better procedure and would relieve him of his trouble and his plug, but he declined to accept it.

DR. E. FLETCHER INGALS, Chicago (closing the discussion): Dr. Bryan thinks that if one cannot get into the frontal sinus, it cannot be operated on. This is quite right. However, I have been able to pass the probe into the sinus in ninety-five per cent of all chronic cases, but in about ten per cent I was not able to get it in the whole distance at first; then I ran a burr up perhaps three-eighths of an inch, after which the probe passed easily into the sinus and the operation was completed. You notice that these probes are of different sizes and curves. If a probe will not go in with one curve, make another one; if a large one, one and one-half millimeters, will not go in, take one that is one millimeter in diameter. If one can do the operation, possibly in five per cent of the cases an external operation may be desirable later on. I would not claim this as a cure-all by any means. The question as to whether drain-

age is sufficient to cure these cases or not is one that we have to determine by experience. Experience seems to show that it is sufficient in most cases, even if there are granulations. It seems to me that scraping out all of the mucous membrane in the sinus is absolutely bad practice.

I do not recall any chronic case in which I have attempted to probe the frontal sinus in which I have not succeeded—at least, after I have run the drill in for perhaps three-eighths of an inch; but I will admit that it has occasionally taken me as much as an hour to do it. But if I can get the probe in once, the next time that I put it in I can make a large opening very easily.

I believe that practically all of the cases will heal if we give them drainage, and I think that most of you will believe this.

DR. ROBERT C. MYLES, New York City (closing the discussion): If you are going to obliterate, you have to obliterate completely; but if you leave one small piece of mucous membrane in the sinus, you will have trouble. Patients are coming to me all the time from the general surgeons with imperfect drainage. If you notice, in my paper I mentioned the fact that they opened the sinuses and left them with a so-called polypoid condition; they simply packed them. The reason of that is that these are not granulations, but an edematous condition called granulations. They will disappear; the condition is the same as the watery eye or the postorbital eye. It is a circulatory condition and not a pathologic one. I admit, of course, that granulation sometimes comes from diseased periosteum.

But fundamentally, the crucial point in all of these cases is to get it open and maintain it open and keep it open; and the results in this way are better so far. I believe that five or ten per cent of the cases have come to external operation, but we are now able to cure a large percentage of them by the internal method. The question of the necessity of distinction enters. I have lots of cases which heretofore I would have determined to require the external operation which are now operated by the internal procedure.

Vincent's Angina.

BY THOMAS HUBBARD, M. D.,

TOLEDO.

It is worthy of remark that many of the clinical articles are reports of very serious or fatal cases. This group of fatalities, in a disease that is usually transient and curable, and taking into consideration the rather scanty literature, arouses the suspicions that a large number of cases are not diagnosed. Laboratory study of all ulcers and false membranes is necessary to positive, timely diagnosis.

He calls attention to perborate of sodium as an efficacious local medicament. The nascent hydrogen dioxid penetrates and disintegrates necrotic tissue and would be, theoretically, an ideal inhibitor of anaerobic bacterial growth. Perborate of sodium is a constituent of the foaming dental powders, and has stood this empirical test with credit.

The local treatment resolves itself into careful applications limited to the diseased tissue. The glycerole of iodine (iodid of zinc, 2; idodin, 3; aq. dist., 5; glyc., 10) applied to the tonsil crypts, is probably the most efficacious antiseptic.

Theoretically the arsenical group is specific in action, and the writer thinks that experience is proving favorable.

He reports a case which presented such a hopeless condition prior to the administration of neosalvarsan, and the improvement following was comparable only to that which we see in diphtheria cases following a proper dose of antitoxin.

In cases that do not yield promptly to this treatment cacodylate of sodium, two and one-half to five grains, repeated in twenty-four or forty-eight hours (if kidneys are not affected). In the malignant type, not improving under the above treatments, give neosalvarsan 0.6 gram (average body weight adult) intravenously.

DISCUSSION.

DR. EMIL MAYER, New York City: I would take some exception to the originality of the use of glycerin of iodine. When I first called attention to this affection we know so well now, I then spoke of the use of idodin, iodid of potassium, and glycerin as a local application. I have since learned to know

the tremendously valuable effect of the salve, either injected intravenously or applied locally.

A very short while ago a patient presented himself at the Mt. Sinai Hospital, New York City, with a very large ulceration at the under surface of the tongue that had been existing for a couple of months and due to the bacillus Vincent. A local application of the salvarsan with an intravenous injection, the Wassermann having first been proven negative, resulted in a cure within forty-eight hours. I would like, however, to see some of the results from the application of the salvarsan locally, without the intravenous injection. It is very possible, indeed, that the application itself would do all that we would require, and the patient might not even require an injection; but it does not mean by any means that because a patient has recovered that that patient has had syphilis, but that this arsenical preparation has a beneficial effect on the treatment and cure of this disease.

DR. THOMAS HALSTED, Syracuse: About a year ago a physician consulted me with the statement that for six weeks he had had a severe tonsillitis. He had contracted this, apparently, from dancing one evening with a school teacher, who had at the time a sore throat which was diagnosed the next day as diphtheria. She died in the course of ten days from Vincent's angina. This doctor developed within a short time an ulcerative sore throat. He was seen by a number of specialists, but the diagnosis was not made, and he finally came to me. I found an extensive and deep ulceration of both tonsils and a marked cervical adenitis. The ulceration was soon proven to be Vincent's angina microscopically. A short time before this my attention had been called by a general practitioner to the possible use of enesol in the treatment of Vincent's angina. Enesol is a French preparation of arsenate of mercury. We used enesol hypodermically and did nothing else. There was no local treatment whatever. The improvement was marked, and at the end of six days, during which time three treatments were given, the ulceration was perfectly healed. Since this case I have treated not less than six or eight cases of Vincent's angina with enesol, and all of them with most satisfactory and rapid improvement. I think enesol is a specific for

Vincent's angina, and preferable to salvarsan, because of the greater safety and simplicity of the treatment.

DR. THOMAS HUBBARD, Toledo: I am very glad that Dr. Mayer mentioned the use of iodine. I would be interested to know the formula he used.

This formula is iodide of zinc, iodine, glycerin. Whether it is more penetrating than the ordinary iodine glycerin preparations, I do not know.

As to the choice of the arsenical preparations, I think that is a question of clinical proof, and I think Dr. Halsted's report only goes to show that the use of some member of the arsenical group is a dependable treatment of Vincent's angina type of infection.

**General Streptococcic Infection Through the Accessory Sinuses
and the Tonsil.**

BY T. H. HALSTED, M. D.,

SYRACUSE.

Chronic suppurations in the sinuses are by no means local diseases in the sense that their effects are confined to these organs.

It is the chronic infections, the staphylococcic, pneumococcic and streptococcic, that are perhaps of greatest importance, because of the insidious and slow degeneration which their absorption produces in the whole system. It is these which are so commonly overlooked and their true significance so little appreciated by both specialists and the general practitioner.

Of equal and perhaps greater importance than local infections of the nose and their adnexa, though only in degree, are the infections of the teeth and of the tonsils.

The tonsils, whether the faucial, lingual or nasopharyngeal, in a normal healthy condition, undoubtedly offer a hindrance and are a barrier to the farther ingress of pyogenic organisms to the lymph or blood stream. Conversely in a diseased and dilapidated condition, these same structures offer a habitation and afford the easiest way, becoming the open portal, for the passage beyond of the invading army of microorganisms.

A mixed infection of the tubercle bacillus and the streptococcus is of frequent occurrence. Just as tuberculosis is con-

veyed from one individual to another through the inhaled sputum, and is mildly contagious, so probably is rheumatism—i. e., infectious streptococcic rheumatism.

It is a matter of constant clinical observation that with enlarged and diseased tonsils, not regarded as tubercular, enlarged cervical glands, thought to be tubercular, are often associated. The removal of such tonsils is usually followed by a reduction in the size of the enlarged glands.

Endocarditis and arthritis often supervene or follow an attack of acute tonsillitis.

Chorea is now known to be a rheumatic or streptococcic infection of the nervous system, that the improvement results because of the removal of the primary focus of infection, the tonsil and the adenoid.

In childhood, tonsillar and lymphoid tissue is most prone to acute infection, and it is at this time of life that acute inflammatory rheumatism and endocarditis, usually following an acute tonsillitis, is most likely to occur.

We shall soon be classifying a great many affections now regarded and treated as separate entities under the general classification of streptococcic disease.

The streptococcus is transmitted from one individual to another through direct or nearly direct contact, such as in the act of coughing, sneezing, kissing, the organism being inhaled into the mouth with the mucus from the infected person, or it may enter through traumatism by means of an infected instrument, or again it may reach the mouth through food, particularly milk, the milk having been infected by those handling it.

As for the treatment of streptococcic infected tonsils, complete enucleation (tonsillectomy) is the rational procedure.

After the tonsils are removed the patient may still show evidence of remote or general streptococcic infection. This means simply that there still remains a focus somewhere, possibly in the adenoids. Possibly the tonsils were not completely removed, even though the operator was most careful, a small piece, no larger than a pea, remaining in the supra-tonsillar fossa or at the base, adjoining the lingual tonsil; and if such is the case, this fact should be recognized and dealt with by a second operation, the sooner the better. Again, an

apical tooth abscess may have been overlooked or the difficulty may lie in a secondary focus in the gall bladder, the appendix, some joint, the endocardium, pleura or other localized area.

**The Susceptibility to Infection Manifested by the Remains of
Incompletely Removed Tonsils.**

BY HANAU W. LOEB, M. D.,

ST. LOUIS.

If a portion of the tonsillar lymphoid tissue is left after operation, especially if it happens to contain a crypt, it is very much inclined to persist in statu quo. It may never occasion any unpleasant result, but it is present nevertheless with its susceptibility to infection, reduced though it may be. What is considered an atrophied tonsil usually signifies that the tonsil tissue has become somewhat more covered by the anterior pillar and has in part simply disappeared from view.

There must be a not inconsiderable number in which tonsillar stumps remain, even in the practice of the most experienced operators, and the writer presents five cases showing infection originating in such tonsillar remains.

These cases definitely show that small masses of tonsil tissue overlooked, or at least not removed at the operation, are susceptible of infection with remote effects similar to those which follow acute tonsil infections.

They must have their counterpart in the practice of other laryngologists, and from his own experience must be common enough to constitute a fairly definite clinical entity.

They present a decisive argument against any form of operation which does not contemplate the entire removal of the tonsil, especially where there has already been some infective processes originating in the tonsil.

They suggest the advisability of following up cases of tonsillectomy to determine whether any portion remains and whether it has become a focus of infection.

DISCUSSION OF PAPERS OF

DR. T. H. HALSTED AND DR. HANAU W. LOEB.

DR. GEORGE B. WOOD, Philadelphia: I desire to call especial attention to the difficulty in recognizing when a tonsil is responsible and when it is not responsible for a given infectious condition. According to my own experience, inspection of the tonsil itself in the majority of cases side little in this determination. Small innocent looking tonsils can give rise to severe general infections, while, on the other hand, large swollen tonsils with masses of epithelial debris in the crypts are frequently found in apparently normal individuals. Of much more value is the history of repeated attacks of tonsillitis, their relation to the general infection, and the presence of cervical adenopathy. The bacteriologic study of the contents of the crypts of the tonsil will often give important data. This study can be carried further by determining the relation of the bacteria obtained from the crypts to the blood reactions of the individual. In a person suffering from chronic tonsillar absorption for a considerable length of time, it is probable that a certain amount of immunity against these organisms has been established. If agglutination of the bacteria from the crypts or a complement fixation can be demonstrated, there would be good reason to believe that a certain amount of absorption had taken place through the tonsil. From a somewhat limited number of cases this reaction has been found in a certain number of chronic cases, though in acute tonsillar infections the immune bodies could not be demonstrated, probably because sufficient time had not elapsed for their formation. The importance of these reactions can only be determined by a large series of cases, preferably carried out by a number of observers.

Concerning the possibility of recurrence of tonsils after removal, I believe that a certain amount of actual recurrence can take place. In these cases the new tonsillar tissue is superficial and is found simply as small lymphoid follicles scattered over the surface of the scar tissue. More frequent and more serious apparent recurrences are simply hyperplasias of tonsillar tissue left behind at the operation.

DR. BURT R. SHURLY, Detroit: Many people think that when their tonsils are removed they will never have another sore throat, and that is not probably explained sometimes by the man who does the operation. Again, we have certain islands of tissue that are perhaps more frequently left in place, and undoubtedly, if we take into consideration all the different operations we have done throughout the years, we will find a very considerable number of incomplete operations. On the anterior pillar itself, very frequently even when we think we have accomplished a very complete operation, we find tiny islands of tissue which can only be observed by a most thorough examination. Many times when we think we have done a most complete operation and go back over the ground again, one, two or three times, we still find some tiny islands of tissue we have left; and if this happens to be on the anterior pillar, it frequently gives rise to more trouble. I do think, though, that there is great danger of exaggeration as to just how much damage results from leaving some of these tiny islands of tissue.

DR. THOMAS HUBBARD, Toledo: I have in mind a throat in which there was perfect enucleation of the tonsil, and yet the patient returned several times and said that she was having recurrent attacks resembling those which she previously had. Finally, one day she returned with a distinct swelling. I was able to pass a probe into the fistulous tract, which evidently led into the muscular tissue, and that was where the trouble was. There was no tonsillar tissue left at all, but showed a most thorough operation. It is probable that sometimes we leave one of the small fistulous tracts which have been part of the peritonsillar suppuration at some previous time. I would say that during these attacks she had a recurrence of the arthritic symptoms, just the same as when the attacks were due to tonsillar and peritonsillar inflammation; but it was a distinct fistulous tract leading into the deeper tissues, and I have not had an opportunity to attempt to eradicate that, although it would be comparatively easy.

DR. J. PAYSON CLARK, Boston: There is one point in Dr. Halsted's paper which I would like to emphasize, and that is the possible relation of unsuspected conditions of the teeth to general infection. I have been surprised at the number of

cases in which a tooth giving no symptoms locally at all, was in very bad condition, and treatment of that tooth at once relieved the general symptoms.

I have been surprised once or twice, and several of the cases I have been able to explain, where I was perfectly positive I removed the tonsil, capsule and all, where the capsule was perfectly smooth and the fossa quite empty after operation, and a year or more afterwards there has been an appearance of tonsil on one side or on both sides. My explanation was that some of the lymphoid tissue of Waldeyer's ring in the healing process has been drawn up into the region of the tonsil. That tissue drawn up differs from ordinary tonsillar tissue in that no crypts appear in it. I have never seen any inflammatory process.

Of seventy-three cases operated at the Massachusetts General Hospital before we had begun to do the capsule operation, in sixty cases the tonsil tissue was still visible; twenty of the cases gave a history of one or two attacks of sore throat since the operation. Of those attacks only ten had been definitely determined upon to be tonsillitis; at least two-thirds of the cases of tonsillotomy had had no subsequent trouble. There were twelve cases of illness since the operation, but none of the cases of illness were of the kind to be attributed to any infection from the remains of tonsillar tissue; these cases were all children.

DR. HENRY L. SWAIN, New Haven: The fact that we do not have more knowledge of the return of tissue after enucleation, I believe is due to the fact that in lots of our cases the person is not as susceptible as are those from whom we do hear. Certain cases show marked susceptibility to inflammatory seizures. If you leave the slightest bit of tissue, you get a report of sore throat and constitutional symptoms, etc. In other cases you can leave three times as much tissue and there is no report of any trouble whatever.

In my home town, a year ago, we had an epidemic of streptococcic sore throat, due to milk infection. In all we had one hundred and twenty cases. I took a great deal of interest in looking into the question of the presence or absence of tonsils. Out of that group there were between twenty and thirty cases who had had thorough removal of the tonsils—

absolute tonsillectomy. None of us would have been dissatisfied with the results of the operation had we done it ourselves. In these cases we sometimes got more trouble than in those in which there is an abundance of lymphoid tissue. The five cases which gave me the most trouble, with abscess formation, edema of the larynx, were in cases of complete tonsillectomy.

The probabilities of general infection such as Dr. Halsted speaks about is illustrated in a most interesting case I had recently, where the patient had a simple sore throat and then developed general poisoning of the system from the effects of inflammation. As a result of that he had a large abscess at the back of the neck which seemed to have a formation of membrane in it, so that one expected to find pseudodiphtheritic discharge. He was given autogenous vaccines in large doses, and it was well carried out in every particular. Six weeks after the original sore throat he came down with another sore throat in which he had exudate over four distinct strips of tissue, both tonsils and both lateral columns of the pharynx were covered by a false membrane. Cultures from this showed it to be streptococcus. He did not have a distinct streptococcemia.

DR. GREENFIELD SLUDER, St. Louis: It is an interesting question all the way through, and that is the matter of peritonsillar infiltrate. The aftermath of the case, the future course of the case frequently has been influenced by the infiltrate that was about the tonsil. That infiltrate seems to me to frequently take the part almost of the tonsil itself. I have seen them a few times, and latterly I have seen a few cases in which the infiltrate behaved as the tonsil—began with a sore throat and suppurated in both cases. The tonsil was perfectly enucleated and preserved in a bottle. I make it a practice in operating upon cases to save the tonsils from every individual, and later on I frequently find that I possess a number of tonsils and capsules which are perfect; but, as Dr. Clark has expressed it, the lymphoid tissue of the base of the tongue has grown up into the fossa and looks very much like a tonsil. The peritonsillar infiltrate may, furthermore, hypertrophy and later on look like tonsil, as if something had been left, unless very carefully inspected. With that end in view, some three months ago, in the presence of a very large infil-

trate, I removed the tonsil with a guillotine and found something which looked like the tonsil still in the throat. I then took out an infiltrate, the size of the original tonsil, and the infiltrate on the opposite side remained. Subsequently sore throat developed, and developed in the infiltrate that was left. The side from which the infiltrate was removed escaped.

DR. HARMON SMITH, New York City: I believe that nature requires a certain amount of lymphoid tissue in that region, and, just as we see when we remove the soft palate for malignancy, the posterior tips of the turbinate hypertrophy to prevent regurgitation of food in the pharynx, so the remaining lymphoid tissue undertakes to carry on that element of protection which the tonsils previously did. I do not believe that spontaneously tissue resembling the original tissue will spring up. I know of instances in which, three or four times after the removal of the tonsils, from childhood on up to puberty, where each time every microscopic evidence had been removed, yet there still recurred certain islands of lymphoid tissue, and around the islands there was formed a certain kind of capsule.

If you remove tonsils and leave lymphoid tissue at the base of the tongue, in such infections as from milk, etc., the lymphoid tissue at the base of the tongue will produce tonsillitis just the same as the original tonsil.

DR. JOSEPH GOODALE, Boston: In certain children who may have tonsils and adenoids removed by operation we may have a condition of partially developed anaphylaxis. It is not a true vasomotor rhinitis, but a condition of snuffing, blocking of the nose, and the symptoms which appear are those of a tendency to taking cold. There may be possibly a portion of tonsils left, but what we should do is to look somewhat further than the throat. We should see if the child is taking more milk than it is accustomed to in the summer, or an extra cup of cocoa, or an extra egg; it seems to me, before we should proceed to a further operation on that throat that we should examine very carefully this question of diet. I would suggest that any of this unusual food should be diminished and restricted, and I am sure you will find that a certain percentage of these cases will lose their symptoms. They will freely dis-

appear without another operation, or loss in weight, but a gain in weight.

DR. HANAU W. LOEB, St. Louis (closing the discussion): I have spoken of the actual leaving of portions of the tonsil in some instances by myself, and in some instances by other operators. I am sure that if operators will examine their cases, one, two and three months after operation, they will find not infrequently that a small mass of tonsillar tissue remains. It so happens that in two instances I was able to verify the fact that I had left a portion of the tonsillar tissue there, because I had the tonsil in a bottle, and a careful examination of the capsule revealed where a very minute portion had been omitted.

With reference to the inclusion of some tonsil tissue in the scar, I feel, at least in one particular case I reported, that the inclusion was there before the scar; in other words, I left a mass there and the scar covered it over. This was the case in which there was a minute abscess in a little crypt. This patient had several attacks of appendicitis which went on to operation, and I feel the little piece I left there may have been responsible.

We should not hesitate to let our patients know when we have performed an incomplete operation. This is better than having an acute infection come on and someone else tell the patient. I do think we ought to protect ourselves in that respect. I for one never hesitate to tell the father or mother of a child that I have left a small portion of the tonsil. Of course, years ago that was fairly common, but I am thankful to say it is uncommon now.

I wanted to bring the matter up to the association, not as an argument for tonsillectomy, but for complete tonsillectomy, and also to assert that the mere statement that an operator is going to do a tonsillectomy does not signify that he is doing or has really done a complete tonsillectomy operation.

**Presentation of Pathologic Specimen of Large Tumor of
Pituitary Gland.**

BY ROBERT C. LYNCH, M. D.,

NEW ORLEANS.

The man was a quadroon, about six feet one inch tall, with hands and feet somewhat larger than usually seen, though not sufficiently so to be suggestive. He was well developed to the point suggesting fat, with a fairly developed chest and mammary gland, and small hips, resembling in a degree the feminine type.

About the end of July, 1916, he had profuse nose bleed, following heavy work, with recurrences daily, when the nose began to block up, voice became hoarse and the eyes began to protrude. Upon examination the septum was deviated strongly to the left, the right nostril filled with an irregular spongy red mass which bled easily upon manipulation; pupils were dilated and did not respond to light or accommodation; pulse, eighty; eye grounds show slight pallor with double temporal hemianopia or loss of vision over the outer half of each eye. A specimen of tissue was removed and the laboratory reported back: "A sarcoma."

The patient in December had the same symptom complex apparent, only slightly aggravated. The exophthalmus was very marked, the superior maxillary prognathism was apparent. The mass in the nose was as described and could be seen in the nasopharynx.

An attempt to remove the mass through the nose only succeeded in getting out a small part. The tissue was reported as granulation or inflammatory, but not malignant. Upon the second trial a facial decortication was done, and at the same time the right antrum opened. This gave plenty of room to remove the mass more completely, but when the roof of the nose and over both orbits were found pulsating, and with the finger he could feel the meninges and see the dura, he was convinced that it was time to stop, fearing lest the sudden loss of support would produce a hernia.

The nose was packed, a large postnasal plug introduced, tying the attached string to the ear. He was returned to bed

in good shape, but upon waking from the anesthesia he caught the string and pulled upon it with such force as to force the postnasal plug through the exposed dura and into the brain. He died from a basilar meningitis.

The specimen was presented for observation, together with the X-ray plates and a microphotograph of the tumor which is characteristic of pituitary gland.

Report of a Case of Abscess of the Frontal Lobe of the Brain.

BY ROBERT C. LYNCH, M. D.,

NEW ORLEANS.

Mrs. L. had been an invalid and a sufferer for considerably more than fifteen years, her condition varying only as to the degree of her suffering, which was often very great. The pain and headache from time to time confined her to bed for varying periods, and frequently the intensity was so great as to cause convulsions accompanied by a severe rigor and a bending backward, so that whiffs of chloroform were used to bring about relaxation. There were varying terms of slow recovery to a condition that enabled her to leave her bed, but she never was well, and had headaches which were almost continuous.

In 1907, following right sided abdominal pain, an ovary was removed with no improvement. In 1909, a panhysterectomy was performed; following this a period of relief ensued, but in 1912 the headaches grew so intense that a rhinologist was consulted. A right maxillary sinusitis was irrigated for nearly a year, but with only varying relief. A change was made, and the second colleague removed the right middle turbinate, opened the right frontal intranasally, and curetted the ethmoid cells. There followed a long period of treatment without relief.

Late in 1913 an acute exacerbation in the right frontal sinus occurred, demanding an external operation. There seemed to be no improvement afterward.

Three years later, after careful examination, Lynch found the right antrum to have a large opening through the inferior meatus, and irrigation of this cavity showed slight pus at times, but which bore no relation to the headaches.

The postethmoid region seemed full and bulging, and he was able to wash nearly a teaspoonful of nonoffensive pus from the sphenoid sinus. Treatments of this character seemed to be followed by considerable relief from headaches and relieved the chronic hawking and spitting complained of, though she had during the period of this treatment one of the chill-temperature headache attacks, which seemed to have a certain regularity as to recurrence, regardless of the treatment employed.

There ensued now a gradual decline in body strength and a slight dullness of mentality, with no desire for food and persistent headaches of increasing intensity, blood counts rising to 17,000 with 90 polymorphonuclears. Blood pressure, 110—rather low; no focal symptoms of any kind, as determined by a most searching examination.

The decline reached the state of involuntary micturition and defecation, mental dullness to almost coma, and inability to suck fluids through a straw, to be roused only on the greatest excitement, and speech then inaudible—still no focal symptoms.

On her return to the hospital, some months later, Lynch determined that the symptoms were those of brain abscess in the silent area—the frontal lobe; accordingly, he opened up the old frontal sinus wound, which was apparently perfectly healthy and sound, but to his surprise there existed a small cavity holding about fifteen drops of milky pus, looking much like an old mucocoele. On removing the membrane from the posterior wall the bone looked normal and was intact completely. He could not feel satisfied, however, that the findings were sufficient explanation for the symptoms, and took down the posterior sinus wall. The meninges seemed normal and not adherent in any direction, and there was no bulging or undue pressure apparent. He split the dura, and the brain surface seemed normal; so he explored with aspirating syringe and large needle, applying suction as soon as the needle was below the surface. After about an inch deep, following the line of the base of the skull and away from the longitudinal sinus and under the anterior horn of the ventricle, there gushed into the syringe about three drams of yellow green pus. He withdrew the needle and prepared the bone opening and area

for the reception of one of Mosher's wire gauze drains; re-introduced the needle and withdrew four drams of pus. Then he opened with a scalpel what he thought was an abscess cavity, but try as he might with needle, knife, or forceps, he could find no evidence of the abscess. Finally, he passed a small rubber tissue drain into the brain, in the direction and to the depth of which he had aspirated pus and dressed the wound. Upon recovery from the anesthetic the patient was conscious, and in six hours addressed him voluntarily, complaining of some soreness about the wound, but not of much headache.

The pus showed staphylococcus aureus in pure culture, but not active, growing feebly on culture.

DISCUSSION.

DR. THOMAS H. HALSTED, Syracuse: In this connection I shall report the present condition of a case of hypophyseal cyst which was operated two years ago and reported to this society in 1915. It is the case of a little girl, eight years of age, who at that time had as the leading symptoms great increase in size of her head, great increase in weight, weakness, constant shaking of head with incoordination of movements, so that she was unable to feed herself; optic neuritis, sharp headaches, very striking change in color and texture of hair, polyuria, and disturbed mental acuity. The operation was done through the nose under local anesthesia; it was the modified Hirsch operation, and the growth proved to be a cyst of the hypophysis. The patient was much improved temporarily. Some months later the cyst recurred and a second operation was refused by the parents. It is now about three years since the original operation. I have not seen the child in a year, but saw the father within the past six months. He said that the child now has simply an aggravation of all the symptoms; she has become very fat and large with great weakness, and the blindness is nearly total.

DR. HENRY L. SWAIN, New Haven: I would like to ask Dr. Lynch what was the condition of the brain of this patient.

I had a case which I saw but once, in which there was bitemporal hemianopsia which was due to a tumor of the pineal gland, in which there were headaches somewhat similar to the second case.

DR. ROBERT C. LYNCH, New Orleans (closing the discussion): In reply to the question by Dr. Swain, as to what was the condition of the brain of this patient, I would say that the brain did not show anything pathologic at all, except that the coverings represented the usual findings of death from meningitis.

We scraped up in New Orleans three other cases of pituitary tumor, and all of them showed on X-ray a very marked enlargement and beginning protrusion backward of the sella turcica. They all showed the same phenomena as regards the eyebrows, and they all showed the symptoms of lack of function of the pituitary gland.

Three Bronchoscopic Cases of Dentist's Origin.

BY BURT R. SHURLY, M. D.,

DETROIT.

As these three cases occurred during the last decade in a city of an average population during this time of 500,000 people, and as we have an estimated population of over 100,000,000, it might be fair to conclude that possibly six hundred cases of similar accident had occurred in the United States and Canada, perhaps, during a similar period. It might, therefore, be of importance to devise a special protective device to prevent the sudden inhalation of foreign bodies during dental procedure.

Again, the question of the medicolegal problem, with questions of responsibility as to whether these accidents involve ordinary care in dental procedure, might be of interest, although exceedingly delicate ground to tread upon, as one of these cases involved a very considerable law suit, and the other two were allowed to pass with nothing more than an attempt to collect the surgeon's fees from the dentist. The medicolegal possibilities did not come to actual trial.

The peculiar relationship of laryngology and clinical medicine and its great importance, one to the other, was again illustrated by the fact that two of these cases first came under my observation as referred cases for clinical examination of the throat and chest on account of long, persistent cough which simulated pulmonary tuberculosis.

Case 1.—Miss S. stated that her cough dated immediately after the extraction of tooth and gas anesthesia. Radiogram showed tooth. Trachea was not cocaineized and bronchoscopy failed. Tracheotomy and subsequent bronchoscopy resulted in removal and cure.

Case 2.—Married woman. Cough followed nitrous oxid and tooth extraction. There was a marked odor of rubber. The air supply of lower part of lung was cut off, and piece of hard rubber, which had been a part of a dental mouth gag, was brought up to the trachea, slipped from forceps, but fortunately coughed up soon after by the patient.

Case 3.—Mr. L. W. B., age forty-nine years; architect by profession; was receiving treatment from a dentist preparatory to filling a tooth. The cavity was treated with a dental burr, which in this particular case was held between the thumb and forefinger during the process of application. This tiny instrument suddenly slipped and was inspired into a lower division of the left bronchus. After this remained in the bronchus for ten days, the patient was sent from his home in the central part of the State of Michigan, to the Detroit Eye, Ear, Nose and Throat Hospital. The X-ray examination reported—anteroposterior and lateral plates were made of the chest: "We find a shadow in the lower left thoracic region, which we think should be interpreted as a metallic foreign body in the lower left bronchus." After a thorough cocaineization with novocain of the respiratory passages, with cocaineization advanced as the tube was introduced and followed to within the lowest terminations possible, and assisted by Dr. Hickey, I was able to extract this foreign body, which was pointing with the needle part upward. The patient recovered completely without symptoms.

DISCUSSION.

Dr. THOMAS HUBBARD, Toledo: It certainly seems that the position of the patient's head in the dental chair is very conducive to the loss of a foreign body in the throat or air passages. Fortunately, most of them go into the gastrointestinal tract. I have in mind a case which recently occurred of a nurse taking dental treatment, in which a small dental burr was lost.

She was taken violently ill and returned to the city with violent abdominal disturbances. The X-ray failed to locate the dental burr, but the operation was really appendectomy, the surgeon expecting to find the dental burr in the appendix. Had this girl, for instance, not had the surgical operation, the appendectomy, in all probability the whole thing would have been laid to the dental accident.

Another case comes to mind in which a tooth was lost and remained in for several years and was then spontaneously expelled. The patient was not very ill any of the time and finally expelled the tooth spontaneously.

The third case is that of a patient, a woman, who carried a fragment of Allen's dental cement, which is quite as firm as a tooth structure, in her left lung for seven months, and during that time had all the symptoms of advanced tuberculosis, with a very considerable abscess cavity around it. This brings up the question, as raised in this case, as to the legal complications which are liable to come up. In justice to the dental profession, I believe we should take them into our confidence in all cases of liability on the part of the dentist, and he should be taken in to see the operation, as occurred in this case. I am sure the dentist paid the bill—or rather he spoke as if he felt it to be his duty to do this. He was at the operation, and this relieves us of any possibility of unfair treatment towards the dentist—that is, if one takes special pains to have the dentist present in such operations where there is any question of his liability in the case.

DR. HARMON SMITH, New York City: I wish to call attention to a case more or less similar to the third case mentioned by Dr. Shurly. The patient was having his back upper molar tooth drilled by a burr, as represented in the third case. The dentist dropped the burr while the patient was in a semirecumbent position with his head backward and drawn to one side. The dentist took up a pair of forceps and when he went to find the burr it was gone. He became alarmed and told this gentleman to have an X-ray taken. The gentleman felt no inconvenience, and instead of that went to a board meeting downtown, and in due course of the day had the X-ray picture taken. It showed the burr in the upper left lobe, and he was then taken to the General Memorial Hospital. He was bron-

choscoped, and the bronchoscopist attempted to remove it. He tried for a while and did not succeed, and asked me to come up. I failed, and we decided then to have Dr. Jackson see the patient. In the meantime another gentleman in town was suggested, and he came and failed. Dr. Jackson came on, and he had another X-ray taken to see exactly where the foreign body was located, and he put it down as a case in which it was impossible to obtain the foreign body. It had lodged in the upper outer lobe of the lung. It was recommended by the surgeons that part of the lung should be removed, but the gentleman succumbed to the operation. The burr, however, was obtained.

DR. ALBERT C. GETCHELL, Worcester: I will add two cases to Dr. Shurly's; one following extraction of a tooth under ether. The patient was operated upon and recovered, and the bill was paid by the society by whom the dentist was insured. The second case was a patient seen recently with a cough following immediately upon extraction of a tooth. This patient developed lung abscess, was operated upon and recovered, and then had a recurrence of the abscess.

DR. CARL E. MUNGER, Waterbury: I know of a case in which a dental burr was lost and the fluoroscopic view showed it just below the vocal cords. Tracheotomy was done and no dental burr was found. I should say that during the administration of the ether there was a good deal of struggling on the part of the patient, and that the burr was coughed up into the nasopharynx and lodged there. Next morning the patient found something in his mouth and spat it out. It was the dental burr. In this case the dentist paid the bill.

DR. BRYSON DELAVAN, New York City: I was familiar, as everyone else in our city was, with the case reported by Dr. Harmon Smith. The thing which impressed me most with regard to that case was the futility, as a general rule, of the radical operation for the removal of a foreign body. In looking over a long series of those cases it seems to me, while the observation may not be exactly germane, unless the bronchoscope will succeed in removing the foreign body, the patient's chances of life are better if time is given before placing him in the hands of a surgeon, than if placed at once in the hands of a surgeon and an operation for the removal of the foreign

body performed promptly. This was exactly my attitude at that time.

DR. EMIL MAYER, New York City: I recall the case of a gold crown of a wisdom tooth which was inhaled by a patient. With the valuable help of our member, Dr. Arrowsmith, I was able to remove this successfully. The case occurred about two years ago. One interesting point in regard to that case was that the anesthesia was rectal, which prevented anything like a struggle on the part of the patient, thus possibly dislocating the foreign body; and another point of interest was that as I removed the gold crowned tooth, Dr. Arrowsmith was standing guard over the patient, with a pair of forceps in his hand, and as that large crown was brought into the mouth and slipped from the grasp of the forceps, Dr. Arrowsmith promptly grabbed it and brought it out.

DR. ROBERT C. LYNCH, New Orleans: I would call attention to the case of a lady who was having a set of false teeth made and the dentist was using plaster of Paris as for modeling. He put in a cup filled with plaster of Paris and pushed this up, forcing her head back, and the plaster of Paris went down into her lung. This was five years before I made a bronchoscopic examination. I removed nine pieces of plaster of Paris from both lungs. I also found at that time a very marked constriction of the bronchials, and these I dilated, relieving the persistent spasmodic cough completely.

DR. STANTON FRIEDBERG, Chicago: We may divide the accidents of work on the teeth and other dental accidents into two classes: First, accidents that occur at the time of operation; and, second, accidents that occur from insufficiently attached or loosely attached crowns and bridges.

In one of my cases the cough came on immediately after anesthesia for extraction of a tooth. The cough persisted for a number of months, and the patient was sent to Colorado, where a picture was made, and she then returned to Chicago. There was a small abscess in the lower part of the right lung. The tooth was recovered by upper bronchoscopy, but the abscess persisted. The patient was under observation for three to four months afterwards, without perceptible improvement.

Another case was that of a man who in an intoxicated stupor loosened a bridge consisting of three teeth, which he

aspirated into the left bronchus. A picture showed the bridge. On attempting to cocaineize the larynx, hemorrhage of the lung started. The tube was introduced, but it was impossible to see anything. A second attempt was made under fluoroscopic bronchoscopy, and although the hemorrhage recurred the foreign body was extracted.

In the third case, that of an aspirated dental broach, upper bronchoscopy could not be done on account of the inability of the patient to open his mouth. In consultation with his surgeon, inasmuch as his symptoms were not acute, we decided not to do a tracheotomy, but to wait until the swelling about the jaw subsided. On account of the fine point of the broach the patient was advised to refrain as much as possible from coughing. Fortunately for him, however, the broach was coughed out several days later.

DR. JOHN F. BARNHILL, Indianapolis: Five years ago some one in Indiana consulted me concerning his daughter, who lived in New Jersey. She said she had had some sort of nasal operation, and on the way home was seized with asthma, and he wished to know what could be done. I suggested that possibly some foreign body had gotten into her larynx or trachea. Later he consulted me again, and requested that he consult Dr. Jackson. She started to Pittsburgh, and on the way coughed out a complete turbinated body that had in some way been inhaled during this operation.

DR. BURT R. SHURLY, Detroit (closing the discussion): I have nothing more to add except to emphasize the fact that there are really a great many of these cases, apparently. If we got them all together there would undoubtedly be a certain number of cases of lung abscess, the details of which have not been properly looked into, which would be proven to be of foreign body origin.

Sodium Bicarbonate in Ether Anesthesia.

BY GEORGE B. WOOD, M. D.,

PHILADELPHIA.

Modern methods of investigation have shown that both ether and chloroform anesthesia, when prolonged for over thirty

minutes, are accompanied by a distinct lowering of the alkali reserve of the blood. It is probable that this mild transient acidosis is a most important factor in the production of post-operative vomiting. It has been further shown that the alkali reserve of the blood can be increased by the administration of sodium bicarbonate, and it is, therefore, a most rational procedure to use this drug routinely as a preoperative prophylactic measure against excessive postoperative vomiting.

DISCUSSION.

DR. EMIL MAYER, New York City: I would like to ask Dr. Wood which dosage of bicarbonate of soda he finds essential in children prior to operation—that is, if one must start with a certain amount of dosage, what practical dosage he has found beneficial.

DR. ROBERT C. LYNCH, New Orleans: I had a sad accident occur to a member of my family which brought this subject pretty closely home, and since that time I have used bicarbonate of soda as a preliminary to all ether anesthesia. Lately we have changed from bicarbonate of soda to citrate of soda as being a little bit more agreeable to the patients. We begin three or four days ahead of the time—that is, preceding the anesthesia—and give doses of bicarbonate of soda or citrate of soda, five grains, and of the former one-quarter of a teaspoonful three times a day. In those cases where we are suspicious of an inclination of the patient to develop evidences of acidosis, we follow the anesthesia always with a Murphy drip, five per cent, glucose solution, one-half pint. This gives our patients very much more comfort and freedom from vomiting. I think the thing is extremely important. It was suggested about three years ago to Dr. Peck, who adopted it. We find that during the intense heat we see many more cases of acidosis occurring than we do in the winter; and always during the spring and throughout the summer months, when we submit a case for general anesthesia, we never omit the preliminary soda treatment and the postoperative five per cent glucose.

We find, also, that the administration of codein and morphin after operation will increase the quantity of acetone in the urine, and predispose to the cyclic vomiting.

DR. GEORGE B. WOOD, Philadelphia (closing the discussion): In answer to Dr. Mayer's question, the dosage should be approximately one and one-half grains of sodium bicarbonate to each year of the child. It should be started the day before the operation, given preferably one-half hour before meals, the last dose being given one or two hours before the operation.

I have not been in the habit of using sodium bicarbonate after the operation unless there is evidence of acidosis, as manifested by constant vomiting or other symptoms, when it should be given by the "Murphy drip."

One other preoperative measure which I think should always be attended to is the proper feeding before the operation. The restriction of food should only be sufficient to assure an empty stomach when the ether is given. The most severe case of acidosis following anesthesia which I have seen was one in which the family physician had, without my knowledge, practically starved the child for twenty-four hours previous to the administration of the ether.

Removal of Foreign Bodies From the Larynx, Disproving Previously Made Diagnoses.

BY HILL HASTINGS, M. D.,

LOS ANGELES.

The rapidly growing use of direct laryngoscopy is showing up many incorrect diagnoses, especially in children, where foreign bodies were found in the larynx and trachea. The increasing number of them makes one feel that it is worth while to report all such cases.

Case 1.—Baby L., aged seventeen months, had been sick for a week with "croup," with gradually increasing obstruction to breathing. The father, a physician, and a brother practitioner, had been treating the patient with the feeling that the trouble was "croup," with slight bronchitis. No diphtheritic membrane had been seen in the throat, and cultures from the secretion had been negative for diphtheria. There had been slight respiratory obstruction and a little fever—100.6 degrees the highest. The baby was asleep in bed at the time of our consultation, and was breathing with audible roughness, but without cyanosis and without any considerable difficulty. The possibil-

ity of foreign body impaction was suggested, whereupon the father said that he dated the trouble to a little choking spell which the child had had when fed some soft boiled egg; but that the child had not really suffered much until two or three days later, when the increasing croupy cough and cry and a little fever had made him disregard the choking event. On waking the child its crying increased the dyspnea and brought on some cyanosis, which subsided quickly when the child again became quiet. Indirect laryngoscopy was a failure. The father preferred to await the result of X-ray examination and the use of simple therapeutic measures before allowing direct laryngoscopic examination. The X-ray examination was negative. The child's obstruction grew gradually worse, and direct laryngoscopic examination was agreed to. After a consideration of the danger of operating without a preliminary tracheotomy, it was finally decided to do a tracheotomy. With the use of Jackson's small-size laryngeal speculum, a piece of egg shell was found embedded in the larynx, between the cords, protruding into the glottis. The egg shell was easily removed. Convalescence was uneventful. The tracheotomy tube was not removed for three or four days because of the difficulty in breathing that resulted on attempts to do without it, which supported the contention that a preliminary tracheotomy was advisable.

The history of the second case was rather indefinite. Baby W., sixteen months old, was hurriedly brought from the country to the California Hospital because of great dyspnea. The child was already on the operating table when the writer first saw it. The only history obtained was that the illness dated back fifteen days to a choking spell that occurred while the child was sucking a piece of mutton chop bone.

Foreign body impaction was at once suspected. Immediate tracheotomy was done without any anesthetic. The patient was practically unconscious from the deep cyanosis. On opening the trachea, immediate relief was obtained and the acute pigeon-breast, tumor-like appearance at once disappeared. The end of a piece of bone was felt at the tracheal opening. The bone, rather firmly impacted above in the larynx, was removed by forceps. It was a large, rather thick sliver, about one inch long, sharp at its upper end. The child's fever and considera-

ble purulent discharge and cough continued for a few days. Recovery was complete, and the patient was discharged on the sixteenth day.

DISCUSSION.

DR. JOHN F. BARNHILL, Indianapolis: I have seen two similar cases. One in a child that had been treated for about four days. This child had a safety pin just below the larynx, closed end down. Tracheotomy was done with easy removal of the pin. Complete recovery followed.

Another child, thirteen months old, with exactly such a history and in such a condition as the doctor described in his paper. The child was treated, as I remember, by four different physicians, all for croup. One believed the child had asthma. The X-ray showed a safety pin in such a location, which was easily removed by tracheotomy.

DR. HARMON SMITH, New York City: A case comes to mind of a patient six years of age, treated by six different doctors. It was treated for diphtheria and had antitoxins, had intubation done on two different occasions, and was finally sent to me by a prominent nose and throat specialist to remove a papilloma of the larynx. So I prepared, on his diagnosis, for a removal of a papilloma of the larynx. As I was going to remove it I saw the tip end of a safety pin lodged in the anterior commissure, wedged in between the two vocal cords. After its removal there was no further trouble.

DR. THOMAS HALSTED, Syracuse: I had a case which was more or less similar to the egg shell case. This child was also treated for diphtheria and had antitoxin for two or three weeks, and then a diagnosis of a probable foreign body was made. That was before the days of bronchoscopy. Tracheotomy was done and three pieces of egg shell were removed; the child recovered.

Since the beginning of bronchoscopy I have operated through the bronchoscope two children, eight months of age, one in which we found a fish bone below the vocal cords, which was removed, and in the other a spicule of glass was found, but which was not removed. We got hold of it, but it slipped the forceps.

As long as fifteen years ago I reported seven cases of foreign bodies in children, all between two and three years of age, all seen and operated within a period of two and one-half years. Recovery of the foreign bodies in these seven cases took place by means of tracheotomy. Six of the children recovered, one dying of pneumonia.

DR. T. HUBBARD, Toledo: I have an X-ray plate which somewhat explains how foreign bodies can get into the larynx of young infants. This is a six-weeks-old baby, with a small, open safety pin. It was located in the posterior commissure, and was working down into the larynx.

There is another case I have in mind, of a fragment of hickory nut shell on the ventricle of the larynx, which by passing in pledgets of gauze and drawing up through the larynx finally released the hickory nut shell.

External Surgery of the Superior Maxilla in Treatment of Nasal Disease.

By JOHN F. BARNHILL, M. D.,

INDIANAPOLIS.

The difference in the viewpoint and method of attacking nasal tumors of the nostril and its environment depends to some extent, no doubt, upon the degree of surgical training of each class of operator, and also upon the respective ability of each to accurately locate the origin of the growth. In case the origin is from the ethmoid, turbinates, septum or one of the walls of the nostril, the symptoms of early obstruction will cause the patient to consult the rhinologist, who, either from tradition or belief in its greater efficacy, will almost without exception attack from within. If, however, the growth begins without the nostril, the general surgeon often sees it, usually at a late state, and attacks it by those external methods universally approved by his branch of the profession.

Again, and rather frequently, malignant disease of the upper jaw attacks the alveolar process first, and from the fact that the earliest symptoms are neuralgia referred to the teeth, loosening of the teeth, and swelling of the adjacent alveolus, the patient is first seen by the dentist, who has been known to treat the teeth and even to extract healthy teeth, evidently

in the belief that the disease is in some way connected with dental surgery.

A study of reported cases of sarcoma especially demonstrate on the one hand that rhinologists often have cauterized and snared at malignant growths in the nose whose undoubted seat must have been in some distant part of the maxilla, while on the other hand the general surgeon has been guilty of removing the entire upper jaw for a disease that had its origin in the nose or in the party line between the nose and antrum.

While it is probably true that the statistics of the rhinologist are better than the statistics of the general surgeon in the treatment of malignancy of the nose and its environment, these statistics are not entirely fair to external surgical methods. It is conceded by all that the length of time a malignant tumor has progressed prior to the operation has much to do with the end results of most operated cases. It is undoubtedly true that the rhinologist and the dentist see malignancy of the maxillæ at an average earlier time than does the general surgeon. Sarcoma or carcinoma develop symptoms of distress much earlier when originating in the nose or alveolus than when the origin is in the antrum. Antrum malignancy may progress many weeks or even months before there is external or nasal swelling and before pressure symptoms cause pain.

A candid view of the facts concerning the surgery of the upper jaw for malignancy is not altogether encouraging. The reasons for this are clear, and some of them have been stated. External surgery of the maxilla is essential, usually more essential, to cure than intranasal surgery. The rhinologist who pretends to do radical intranasal surgery should prepare himself to follow surgical disorders leading from the nose to any part of the upper jaw, if not, indeed, to wherever they may lead. When this is done, and when the diagnosis is made earlier than at present, great improvement of statistics may be expected.

All textbooks undoubtedly lay too much stress on total excision of the maxilla, for the reason, apparently, that it is presumed the disease has always advanced to a point that involves the whole upper jaw, or that any procedure short of total excision is inadequate.

One of the chief objections to the external surgery of the maxilla has been the deforming scars, the misplaced eye, and the palatal defects that result. Early and definite diagnosis as to the seat of the beginning of the growth, and an early studied plan of operation, will very largely avoid this objection. Heretofore the plan of operation has been too much a matter of doing one of two things in any given case—namely, some degree of intranasal surgery by the rhinologist, or complete removal of the jaw by the general surgeon. Earlier opportunity and sufficient thought bestowed on any given case on how best to break away from the traditional plan of total resection will in all probability find a satisfactory modified, yet thorough, operation to fit each condition present.

The writer has seen but four cases of undoubted malignancy whose origin was evidently within the nostril. Three of these cases were sarcoma, one epithelioma. All were operated intranasally, with one recovery—a spindle cell sarcoma of the inferior turbinated body. Two cases later extended to the ethmoid and antrum, were operated externally, one dying within about one year following the external operation, and the other within eighteen months. One case returned in the nasopharynx, and was so rapidly extending that the patient lived but a few weeks after the onset of the nasal ailment.

DISCUSSION.

DR. JOSEPH H. BRYAN, Washington: I am very much interested in this paper of Dr. Barnhill's, for I am in favor of external surgery in these cases. I had a case operated upon this spring, not a malignant growth, but an exaggerated fibromatous condition. The face was enormously distorted, the eye greatly displaced, and it was clearly impossible to remove it intranasally. I did the Moore operation, and was greatly pleased with the tremendous facility which it afforded for the complete removal of everything within the maxillary antrum, and also the facility with which it aids in removing not only the growth in the antrum, but the complete removal of the whole nasal wall, including the superior middle and inferior turbinate bodies. In this case, unfortunately, the under surface of the wound became infected and broke down. It healed thoroughly, and while the scar is somewhat on the lower border, it was

more than a good result under the circumstances. I believe this operation of Moore is by far the best operation—that is, for complete eradication of all these growths which take place within this cavity. This was not a malignant growth, but the same thing would apply to any growth which takes place within that sinus.

DR. BRYSON DELAVAN, New York City: The reference to the treatment of nasopharyngeal fibroma leads me to say that I stand exactly where I did when I published the articles on that subject. Of course, there are exceptional cases where the growth has advanced far beyond what is usual; where it involves the sinuses to such an extraordinary degree that it is not practical to apply the treatment—the old fashioned at least thirty-year-old method of procedure of removal by electrolysis, which in the case of the less well developed growths has never been improved upon.

I have never heard of a case dying from the plan of treatment to which I referred, and I have not been able to find any in the literature where death has resulted, and the results are far better in every respect.

Hence, I want to again call your attention earnestly to the value of the electrolytic method of removal.

In any attempt to treat such cases with radium, it cannot be brought into communication with the growth. In those cases the best plan suggested has been the opening of the maxillary sinus, and the best avenue of approach seems to be through the roof of the mouth, where complete access can be gained to the maxillary sinus and where the opening can be kept patent. This is a great advantage, in that it enables the application of the radium to be made.

DR. HANAU W. LOEB, St. Louis: I reported a case a number of years ago in which the tumor was removed by the electric cautery, and in which the hemorrhagic tendency was tremendously reduced by using the electrolysis method.

I may call attention to the ease of going into the nasopharynx by removing the posterior portion of the palate, as I did in a case of carcinoma in the epipharynx, a case not yet reported. The ease with which we were able to remove the mass from the nasopharynx was remarkable.

DR. D. C. GREENE, JR., Boston: The subject as presented involves the field of rhinology occupied previously by general surgeons, and I would like to say a few words with this point in view.

As Dr. Barnhill has said, the tendency has been for general surgeons, in cases of malignant disease of the upper jaw, to perform a stereotyped operation, usually the classical operation, for removal of the upper jaw. In many cases such an operation removes a great deal of healthy tissue unnecessarily, and, what is worse, fails to reach the limits of the disease. It seems to me that we, as rhinologists, are especially qualified, by reason of our technic in intranasal examination, to carry out more careful observation and removal of the diseased tissue than the general surgeons.

I have been fortunate enough to operate successfully on three cases—and there has been no recurrence in either case—of fairly extensive sarcoma of the nose involving the antrum and ethmoid sinuses, in which a complete exposure of the growth was obtained by means of the Moure incision, so that complete removal of the tumor could be effected in each case. The results have been most satisfactory. One case operated on eight years ago has had no recurrence, another four years ago, and another one a year ago.

My point is that I believe it should be emphasized that we are better qualified to examine and treat these tumors surgically than the general surgeon, because of our general training and technic in intranasal work.

DR. JOHN F. BARNHILL, Indianapolis (closing the discussion): If we can definitely demonstrate that the disease is in the floor of the nose or on the septum, it then seems, judging from statistics, that we are entirely justified in attacking the disease by means of electrocauterization. But if, as may happen, the disease has begun in the nasoantral wall, or has begun in the alveola and spread to the nose, or in the antrum and spread to the nose, or has begun in the ethmoid and spread to the nose, the rhinologist should recognize that fact, and then either send this patient at an early date to a surgeon, or, if he is himself qualified to deal surgically with it, he should do that. It seems to me that the time has come when we should

not be guilty of attacking a great subject in a small way, as has been done in nasal surgery of sarcoma.

I emphasized, or tried to do so in my paper, the fact that the general surgeon has not gotten these cases in time to do anything else but make the kind of an operation that he has usually done. We have attacked this disease and worked at the job, as it were, until there was often nothing else to do but to pass it over to the other fellow, and the other fellow often passes it over to the undertaker. There was nothing else to do but to pass it on to the undertaker when it got so far along. But it is possible in nearly every instance, if we use some skill, judgment, care and patience, to make a diagnosis in these cases early enough and operate in time to cure at least many of these patients.

Report of Cases of Bilateral Abductor Paralysis of the Vocal Cords.

BY RALPH BUTLER, M. D.,

PHILADELPHIA.

The first case was eleven years old, and had congenital syphilitic cerebrospinal meningitis, causing ptosis of the right eyelid and internal strabismus. The biceps, triceps, and knee jerks were absent. The pupils were irresponsive to light and accommodation. The laryngeal symptoms, dyspnea and stridor began when he was six years old, but disappeared after three doses of salvarsan, to recur three years later. The second case was a man sixty-two years old with a neoplasm in the upper part of the chest and neck, including the thyroid gland, and causing almost complete occlusion of the trachea. He had been under observation for five months, and improved under mercurial inunctions. The third case was a fatal one following the removal of the thyroid gland.

The cases illustrate the greater danger from a sudden paralysis. The first two cases have been able to go about for many months with relatively little discomfort from obstructions which were little, if any, less than that which was fatal to the third, in which the paralysis was very rapid in its appearance.

Bert believes the greater mortality from sudden obstruction is due to reflex paralysis of the respiratory centers through

irritation of the laryngeal nerves, and Krieger maintains that it is due to irritation of the cardiac branches of the vagus.

DISCUSSION.

DR. WALTER F. CHAPPELL, New York City: I would like to call attention to the case of a patient, a man forty-five years old. His present illness began one month before admission, when he became hoarse. This continued and was followed by dyspnea, at first on exertion, later continuous. His only complaints were hoarseness and dyspnea. When he entered the hospital a tracheotomy was done at once, as the vocal cords were immobile and almost in contact. The Wassermann and X-ray of chest were both negative. Salvarsan was given twice and had no effect. Two weeks after admission, under suspension, the left vocal cord was removed with scalpel and punch. Three weeks later, as there was not space enough between the cords, the left recurrent laryngeal nerve was cut at the entrance into the larynx. In ten days the tracheotomy tube could be removed. When seen two months after the last operation, he was at work and breathing easily. Cutting the nerve not only allowed the vocal cord to recede into the cadaveric position, but caused an atrophy of that side of the larynx which gave still further space. The man was to report if he had any difficulty, and has not as yet, so it is presumed he is well. Several physical examinations and nerve reflexes were negative.

DR. GREENFIELD SLUDER, St. Louis: I would like to add the record of a case seen in consultation. A physician, twenty-eight years of age, who developed acute laryngitis, apparently a grippe, and with it a very violent dyspnea which, upon inspection, showed bilateral posticus paralysis. The cords were almost in the median line. The glottis was represented by a slit through which you could have dropped an old-time silver five cent piece. The recovery was not exactly uneventful. It required some six weeks, during which time he became excited about something and smothered almost to death. Nine or ten months later he developed another infection, laryngitis developed, and again posticus paralysis, and through the three attacks I saw him in consultation.

DR. BRYSON DELAVAN, New York City: Several years ago I was called in to see a case at St. Luke's Hospital suffering with dyspnea, and I found a marked abductor paralysis. I was obliged to do an immediate tracheotomy. The obstruction, however, was not entirely due to the laryngeal box. At a certain distance below the larynx, in the trachea, we also found constriction, and endeavored to overcome it by insertion of a long tracheotomy tube. The child died of exhaustion, and was found to have a large tubercular lymph node pressing upon the trachea, which was evidently the cause.

DR. W. B. CHAMBERLAIN, Cleveland: I have in mind such cases as occur in the early stage of locomotor ataxia. My attention was attracted to this a number of years ago by a patient who was found unconscious in the street and taken to the police station on the suspicion of being drunk. After the usual delay it was discovered that he was not drunk but ill. On examination we found complete abductor paralysis and other signs of locomotor ataxia. I then went over to the City Hospital and made a routine examination of all tabetics we had there, and was surprised at the number of cases in which we received no history of this condition, where we found paralysis.

Some few days ago I had a patient, a man about thirty-five years old, an Italian, who came with a history of dyspnea and difficult respiration, especially on exertion. I thought, of course, of the possibility of a foreign body, but examination showed bilateral abductor paralysis. I wished to refer the man to the hospital, but he disappeared. Some four weeks later the consultant told me that he found the man in an acute attack of dyspnea from which he succumbed in a short time.

Some Clinical Observations on the Lingual Tonsil.

BY GREENFIELD SLUDER, M. D.,

ST. LOUIS.

The diagnosis of lingual tonsillitis is simple in acute follicular cases. Should it not assume the follicular markings, it is often overlooked, particularly when the mass is not enlarged. It is recognized under these conditions by its color alone. The mass may be much enlarged in acute or chronic

cases, which is, of course, easily recognizable. Not so easily interpreted is an occasional small slightly reddened follicle. These are often the origin of the symptoms.

The prognosis for singers and speakers, according to the writer's experience, should be guarded. A lingual tonsil which easily becomes a disturbing factor, either from the work of singing or speaking or from infection, must be considered most seriously. He does not believe that the singing or speaking voice can be developed to any great extent under these conditions.

The treatment of lingual tonsillitis in the acute follicular stage is like that for the faucial tonsils under like conditions. For the subacute or chronic state, with or without enlargement, nothing has been so satisfactory as applications of a small amount of silver nitrate saturated in fifty per cent glycerin. Salicylic acid saturated in ninety-five per cent alcohol is helpful, and does not taste so unpleasant. These may be made daily or as seldom as ten days. For the enlargement, galvanocautery destruction has seemed best. Hemorrhage following surgery of the lingual tonsil is more difficult to manage than any in the upper air passages.

Many of these observations have been made and recorded in more or less this form. The association of lingual tonsillitis with thyroid gland disturbance and with glossodynia, he believes has not hitherto been recorded.

It is his interpretation of clinical laryngology that the lingual tonsil plays a major rôle.

DISCUSSION.

DR. ALBERT G. GETCHELL, Worcester: I am very much interested and impressed with this account of the lingual tonsil. The disease undoubtedly has certain lesions that we probably do not appreciate. There is no question that there is definiteness about it and its lesion. I would like to call attention to three points which have impressed themselves upon my experience: first, its relation to the nervous system; second, to hemorrhage; and third, to cough.

There is no question but that trouble in this region would cause cough, but still I think that continued cough should not be attributed to such a lesion without a most thorough exam-

ination of the lungs. Simple examination of the sputum, without any examination of the lungs whatever, will often show the real cause of the trouble.

DR. HENRY L. SWAIN, New Haven: I have often seen how many times the sources of little lesions and the inconveniences that patients have suffered from could be attributed to and explained by conditions found in the lingual tonsil. The circulation of the lingual tonsil is peculiar—or, rather, its relation to the veins of the base of the neck is peculiar. The veins from the surface of the tongue gather together into certain large vessels deep down in front and underneath the lingual tonsil. The sudden occurrence of a feeling of fullness is perfectly explicable when you consider these venous branches which gather together underneath the lingual tonsil.

It is equally a fact that emotional stress, like an irritable plexus, is sometimes evidenced by this feeling of a lump in the throat, and this condition which I have described explains it.

It is perfectly possible to have a lingual tonsil cough and a bronchitis existing in the same person. If one treats the bronchial part and not the lingual tonsil, he is falling far short of his duty.

DR. J. PAYSON CLARK, Boston: My experience has been that the enlargement of the lingual tonsil is observed most frequently in middle aged women. The enlargement of the lingual tonsil in children, in my experience, is a very rare condition.

I have had to remove the lingual tonsil in several cases, and have used Myles' lingual tonsillectome. I have also used the wire loop. If this loop can be used it is better, because you are less liable to have hemorrhage. I have not had hemorrhage in any of my cases. I remember being called late one night to see a case for bleeding, where another physician had removed the lingual tonsil that day. The bleeding was not violent, but persistent, and I had a little difficulty in stopping it.

DR. THOMAS HUBBARD, Toledo: I think there is no question about the intimate association between acute throat conditions and acute thyroiditis, because I think we find many cases in which we are able to successfully treat the subacute chronic

throat because it is most helpful in the reduction or checking of acute thyroiditis.

In a ten-year-old child, four years after removal of her tonsils and adenoids, her lingual tonsils were found enormously enlarged. There was no suggestion of recurrence of either tonsillar or adenoid tissue, but these large masses were a mechanical obstruction to swallowing, and also made the swallowing more or less painful. To prove that, I clipped off portions of the lingual masses, and following that there was no inflammatory reaction.

DR. ROBERT C. MYLES, New York City: There are several points about the lymphatic tissue at the base of the tongue. It seems to me that a very interesting one is whether the removal of the tonsils in early life does not by some vicarious attempt on the part of the lingual tonsil to supply the physiologic function of the tonsil, result in their becoming hypertrophied in this attempt.

It has been my habit for many years to remove lingual tonsils in a little different way from that originally indicated. On account of some hemorrhages and cicatricial tissue, I have tried to devise some method of obviating both; one was to take out every other lymphatic tonsil with a guillotine and leave an intermittent one. That aided me very much in relieving the scar tissue. I have also left islands of tissue. In using the guillotine one should not press too deeply. If you go beneath the tonsil you are more liable to have hemorrhage than if you put the proper pressure on the guillotine, which makes it possible to remove as much as you may elect.

DR. BURT R. SHURLY, Detroit: The importance of this relationship of Waldeyer's ring to the thyroid is certainly a very exact and definite thing, but the key to the whole situation, to my mind, is infection. And while this paper which was referred to by Dr. Sluder was written five years ago, I have followed up carefully a large series of cases since that time. Of course, as Dr. Sluder says, no one expects to treat cases in this manner and not have the proper surgery of the thyroid attended to when that is necessary.

In regard to cases of hemorrhage from the throat, I think perhaps there are a great many mistakes made by not properly examining the chest. We know full well that twenty-five per

cent of all cases of pulmonary tuberculosis have hemorrhage at some time or other during the course of that disease, and it seems to me that it is just a matter of not thinking of that. We should always have a very thorough and complete chest examination wherever there has been hemorrhage from the throat.

DR. JOHN MACKENTY, New York: I believe that any infection in the throat may have secondary expression in the thyroid. This was brought home to me very forcibly by the case of a man with a foreign body in the esophagus. I put in the bronchoscope and failed to get the foreign body, but found the spot where the body had rested. This man was very ill, with a high temperature and pulse, and had a tender enlarged thyroid gland. I was positive there was pus in the neck, and opened the neck and went down and found no pus. I then opened the thyroid gland, and in the center of the gland I found a large abscess which was secondary to the condition in the esophagus.

On another occasion, following the removal of the tonsil, there was considerable local infection and the patient developed acute thyroiditis. So I believe we may say that any infection in the throat or nose may have secondary manifestations in the thyroid, either simple or suppurative.

With regard to the question of bleeding of lingual tonsil, I have found benefit from forcibly pulling the tongue forward and holding it in that position for a time.

DR. MAX A. GOLDSTEIN, St. Louis: In reference to Waldeyer's ring, I think it has been rather insignificantly looked into, and Sluder's observation about the relationship to systemic infections taking place through this small lower lymphoid mass ought to give us much food for thought. We are doing a lot of operative work on the faucial tonsil, and our enucleations are coming thick and fast. We know that even when the faucial tonsil has been thoroughly encapsulated, we do have recurrences of systemic infections; and it is likely that many of those infections come, not through the lingual tonsil, but through the lymphoid masses which lie about the pillars. There is some possibility that such observations as were presented by the essayist may give us an opportunity to think of

this radical surgery when the time comes for the pendulum to swing the other way.

Dr. Swain has pointed out on previous occasions that the mass of lymphoid tissue is rather dependent for its pathology and inflammation more on the intense venous relationship than on the lymphatic. I think that varicosities are sometimes as frequent in lingual tonsil as are the acute and chronic follicular inflammatory reactions, but those are things this paper has brought forth, and I believe that the development of this particular phase of Waldeyer's ring will give us a little closer insight into the whole pathology of this lymphoid area.

DR. GREENFIELD SLUDER, St. Louis (closing the discussion) : I feel that a very substantial addition to the paper has been given by Dr. Swain in his explanation of the globus hystericus. I did not know the network arrangement of the veins beneath the lingual tonsil, and it is not recorded in any of the anatomies I know of.

Dr. Clark spoke of the enlargement of the lingual tonsil in children being rare. That is not my observation. The enlargement of the lingual tonsil in children is a very frequent manifestation.

I have seen the faucial tonsil take on the recurrent inflammatory reaction with sore throat after faucial enucleation.

That the chest must be investigated in cases of cough seems to me to be self-evident.

Some Points in the Surgical Treatment of Goiter.

By J. E. MACKENTY, M. D.,

NEW YORK.

The writer emphasizes the need of laryngologists, and especially the younger men, to take up the surgery of the neck.

He considers all treatment with rest as a basis as deceptive, and the delay engendered pernicious. He does not, however, advocate surgery in all cases. In all progressive cases, short of already advanced toxicosis, some surgical effort should be undertaken, such as boiling water injections into the gland, ligation of one or more poles, removal of half the gland, with or without ligation of the remaining poles, etc.

In well developed and progressive toxic goiter nothing short of the ablation of three-fourths to seven-eighths of the gland can be relied upon to effect a cure. No operation should be considered until after the patient has been under observation in bed for a length of time, and has undergone a careful general examination.

Clinic calorimetry is now used to differentiate the active periods of the disease and to accurately determine the degree of benefit from any surgical or medical treatment. Early operation is most important. Local anesthesia should be rarely used, and never for any extensive operation. Deep anesthesia is not requisite. Rapidity of technic must be combined with gentleness of manipulation or it is valueless.

By complete operation is meant removal of from one-half to seven-eighths of the gland. In operating the four important things to be considered are: The parathyroids, recurrent laryngeal nerves, hemorrhage, and the amount of gland tissue to be removed.

These are considered in detail. Free drainage with a liberal opening is important, and permits continuous saline irrigation through the tubes, which is often exceedingly valuable.

Thyroidemia may be avoided by attention to the following points: Careful preliminary treatment, rest, overfeeding, etc.; the reduction of a minimum of fear on the part of the patient, light anesthesia, nontraumatic surgery, the judicious selection of the proper operation and correct time of operation; alkalies and water before operation, etc.

The following types of hyperthyroidism are bad risks:

1. Where the disease is progressive in spite of rest.
2. Cases showing no remissions.
3. Appearance of psychosis.
4. Very active symptoms in cases with small glands.
5. Marked exophthalmus.

No case should, however, be refused some form of surgical help, providing it can be established that the disease is not in its terminal stage.

DISCUSSION.

DR. JOHN F. BARNHILL, Indianapolis: It would be a fatal mistake to attempt any sort of operative procedure in a case

in which the heart is so dilated or hypertrophied as not to be able to withstand the operation. The mortality from simple cases ought to be pretty nearly one hundred per cent.

I know of no other operation in surgery, except brain surgery, where a competent anesthetist is more useful than in this operation.

Every precaution must be taken to preserve the parathyroids, and this is best done by leaving a portion of the capsule posteriorly. The capsule in this operation I believe is the anatomic structure which must be borne in mind more than anything else, and if one loses his capsule and works outside the glandular capsule, he is lost for the whole operation, and he cannot, therefore, be certain as to whether he will injure the nerve or remove one or more parathyroids. Hence, his procedure must keep the surgical and glandular capsule in mind all the time, and if he works between them it is almost impossible either to injure the recurrent laryngeal nerve or to take away the parathyroid glands.

The patient is already, in toxic cases, badly run down, and, therefore, clean and bloodless surgery here is the thing. Shock does not occur often if you do not lose much blood.

The amount of a gland to be removed is an important question, requires the greatest knowledge, and it is here, I think, that consultation is often necessary. To remove three-quarters or seven-eighths of a gland that does not need that much taken away is a mistake. To leave it if seriously diseased is equally a mistake.

There are often other glands involved along with this gland, and if that fact is not ascertained before operation and operation undertaken, the operator will almost certainly have a death, because to remove a toxic thyroid does not in such instances cure the case.

The gland must not be handled roughly or pulled up unnecessarily with heavy instruments by the operator or those helping him. It must be handled gently, because if there is toxemia there may because of rude handling of the gland be unnecessary toxicity after operation.

DR. THOMAS HUBBARD, Toledo: I see many of these cases before and after operations with reference to voice interference and difficulty in respiration. Fortunately, most of the cases

in which there is an impairment of the vocal cords, usually unilateral, improve within a reasonable time after operation. In others a supplemental action takes place in the opposite vocal cord, ultimately producing impaired voice, with permanent impairment of movement of the cord on one side.

DR. HARMON SMITH, New York City: I have tried to ascertain in how many cases the nerve was involved previous to or during the course of the operative procedure. I have reached no decision which enables me to make any statement relative to the positive number, but a great many were involved previous to the operation. There was a paresis and not a paralysis. I expect to make some reports relative to it in due course of time.

DR. JOHN E. MACKENTY, New York (closing the discussion): The reason for two tubes is that when you take out more than half the gland you have the trachea dividing the field. If you wish to secure complete drainage, you must put a tube on either side of this tube.

I believe the involvement of the laryngeal nerve interferes to some extent with the finer quality of the voice—as for singing or public speaking.

I have injured the nerve on one side and had impairment of the voice for a fair length of time, which was always recovered from, so far as speaking was concerned.

The Mayos report considerable percentage of nerve involvement before operation. I have examined cases pretty carefully, and have not been able to corroborate this. In a few cases there seems to be some lack of proper tone or movement of the cord, but not to the extent the Mayos report in their examination of cases before operation.

Discussion on Report of Council of National Defense.

DR. CHARLES W. RICHARDSON, Washington: We, as citizens of the United States, have benefited to an unusual extent from our citizenship in this country, more so than citizenship in any other country as individuals. We have profited by this; our success has been great, our comforts have been manifold, and it is no more than right that we should assume the duties and obligations of citizenship, and offer our services fully to our country, and encourage all those with whom we come

in contact with this spirit of enthusiasm. We must stand, gentlemen, for our country, for democracy, and for the suspension of this horrible war, as soon as we can; and by giving aid and comfort and doing our utmost by enlisting ourselves and causing others to enlist, we can bring this about.

DR. HARRIS F. MOSHER, Boston: What the government as of us today is a wholesale coming into their ranks without reservation whatever. They say they can make no promises. On the side they intimate that perhaps, probably even, the special man will be used for special work, but no promises are given, so that you have to make up your minds whether you will go on with the feeling of a slacker and wait until you are asked to do special work, or go in today and run your chances of being put to work with which you are unfamiliar. The only way out of that is to stay in this uncomfortable position until some action is taken toward the forming of a special base hospital. When you read the report, if you do, you will find that was recommended. If you talk with the men from Washington you will find they feel that will come. Major Lister said that will probably come, if Pershing carries over the amount of men he is supposed to carry over, within the next six months. Until that time I am unhappy, and I feel very many of you are unhappy. I do not know what to do. It is a much easier thing to go in and a much harder thing to stand out. I for one am going to stand out until the time comes to go in and do the work I think I am more able to do.

DR. ROBERT C. MYLES, New York City: I have had some very peculiar experiences lately at the New York Polyclinic where we have three hundred specialists, and a lot of them have joined this corps, and I wish you could see some of the work they are doing. It is so far removed from their specialty that they know nothing about it. It is simply ridiculous. I do not know what I could do if I was sent down to the Mexican border to treat dysentery. According to what we hear, that will all be corrected later. There ought to be some action or activity, some committee formed or appointed with a medical officer to plan some law to relieve the situation. The eye and ear are two of the most important organs in war.

DR. JOSEPH H. BRYAN, Washington: This is a very important matter for us as citizens and as specialists, but we must remember that we are at a very grave crisis, and every man, young and old, every woman and every child, has got to come forward and do something. This is no child's play. This war, according to the best thinkers and the best observers, is not going to be over this fall, this winter, or even next, and every resource of this country has got to be utilized. I have gone into the Officers' Reserve Corps, having served some years ago in another branch of the service. Of course, it is a very hard thing to do, to go in and abandon the care and responsibility I have, but nevertheless I feel that having served once it is my duty to go there again. I have gone in voluntarily and am willing to accept any position. I have accepted a subordinate rank; I can serve as Captain just as well as Major, and am perfectly willing to do that, but we are all in bounden duty to do something to help out in this crisis. On the other hand, I think if the matter is brought very forcibly to the attention of the Surgeon General of the United States Army by these various societies, representing that men of experience, men who have developed these specialties of the eye, ear, nose and throat, are best fitted to work in the base hospitals or some hospital devoted to the treatment of diseases resulting from injuries, and that they can best serve their government if their services are utilized along these lines. I am sure the Surgeon General will treat you courteously and possibly do something along those lines. Of course, you must remember that the war department has been working on a basis of a hundred thousand men, and has to work now on a basis of over two million men, and have not got the system or force to combat these difficulties. They are swamped with work at present. But if we will take the stand and assert that our services are best utilized along the lines on which we have been working, I believe some impression will be made upon them. In the meantime we can all go in and serve our country, to the best of our ability.

DR. BURT R. SHURLY, Detroit: It will undoubtedly be necessary to establish a number of base hospitals of the eye, ear, nose and throat. We have one by way of example in the British army now located at Folkestone, which has done

very wonderful service for the British army. If we could have a base hospital on the foreign service, and one in this country, or more as will be necessary, and organize the eye, ear, nose and throat hospitals of the various large cities as they are already organized, and have a definite method of referring all cases from these five hundred bed base hospitals of the general base hospitals to the special hospitals, we would undoubtedly be able to organize and establish a splendid service for the army of the United States at home and abroad.

It seems to me that this wonderful scientific usefulness simply requires organization and authority. Without the authority of the Surgeon General's office we can do nothing whatever, because there must be a definite plan of work, and the organization must be a definite one, and follow along a very definite plan, which has been worked out with very great detail by the Surgeon General's office.

Undoubtedly, the organization and equipment of an eye, ear, nose and throat hospital would require special organization and equipment. These are things which have never been done before in this country. Therefore, it does seem to me the time has come when a committee from these various societies should organize and send out at least two base hospitals. Therefore, there are forty-eight highly trained efficient specialists to care for certain cases from the various base hospitals which the ordinary eye, ear, nose and throat man on the staff of this hospital is not able to properly care for.

DR. JOSEPH H. BRYAN, Washington: I would like to emphasize one fact. In case this committee is appointed, and I hope it will be, the matter can be brought directly to the attention of the Surgeon General, and the fact emphasized that the men who are highly trained in the various specialties will be wasted if they are sent on the ordinary staffs, and the point made that now there is actually a very great waste of good material to be sent on duty of that kind when the younger men can be utilized for that purpose, and that we as highly trained specialists should be called upon to do the work as outlined by Dr. Shurly.

DR. CHARLES F. RICHARDSON, Washington: If we appoint this committee, which I hope will be done, I am sure the Sur-

geon General and assistants, both of the army and navy, will listen to that committee and will do all that that committee wishes—that is, within reason.

Every man knows what his duty is to himself, to his family, and to his country, but there is one fact that stands paramount. The example of the class of men that represents this society to the younger medical men throughout the country is a great one, and should not be lost sight of. If you can go about among the younger medical men and say, "I am already in the service," that young man is going to think, and he is more apt to offer himself to the service of his country if he knows that we have already offered ourselves freely to our government, to be used as the government sees fit. And I hope that the men of this society will offer themselves freely for the service of their country to be used as the army authorities may see best and fit to make use of them.

DR. D. BRYSON DELAVAN, New York City: I represent that type which does not know just what to do. I do not know what my place is. For a year and a half I struggled to establish a hospital in Paris for the repair of injuries of the head and face. At the end of the first year sixty thousand men were needing repair in that department alone, simply from France and Belgium. I am chairman of the Executive Committee of the American Red Cross Hospital in Paris, managed by Dr. Blake. The nearest member of my family last week got an ambulance unit that is on its way to the front, and each week a certain number of us go to the Naval Recruiting Station and examine ears and throats. In other words, not knowing what to do, like all the rest, we are willing to take the first thing that comes to hand and do the best we can. Dr. Shurly has touched the keynote when he said that organization is needed.

DR. MAX A. GOLDSTEIN, St. Louis: Without much circumlocution I would suggest that there be a propaganda of education to put us all in a position to study the question as carefully as we know how. This might be developed by the committee already urged. Personally, at the present time, I should like to place at your service for this organization and its committee, the *Laryngoscope* and its editor, for any publicity work you require whenever and as often as you require it, and to place

at your disposal furthermore the mailing list of the office of the *Laryngoscope*, which includes the names of three thousand men of this country.

Final Conclusions Regarding Amputation of the Epiglottis for Tuberculosis.

BY LORENZO B. LOCKARD, M. D.,

DENVER.

Amputation of the epiglottis is as safe a procedure as tonsillectomy. In over four hundred cases, in the majority of whom vitality was reduced to the lowest ebb, not a single direct fatality resulted.

The objection most frequently advanced is that no operative procedures are justified unless the lesion is so circumscribed as to be capable of complete excision.

It must be borne in mind that in nine cases out of ten the sole object is palliation, and usually in patients upon whom all other methods of treatment have failed.

Even when a cure is considered possible, removal of all involved tissue is not invariably essential to success. It has been demonstrated repeatedly that when an epiglottis is universally infiltrated, and only the upper half or two-thirds is removed, the stump rapidly recedes to normal. It is rare that the disease recurs in the stump.

Healing of the stump is usually rapid and complete, regardless of the extent or rapidity of progress in the complicating pulmonary and laryngeal lesions, hence the question of advisability of operating in this manner hinges upon two questions: in incurable cases what amount of relief may be anticipated, and in cases otherwise hopeful, what influence will the operation have upon the accompanying laryngeal lesions?

A number of patients are living upon whom the operation was performed from ten to twelve years ago, as a palliative procedure, and in whom the resultant unexpected improvement in lungs and larynx was so complete that eventual arrest ensued.

The improvement in accompanying lesions can be ascribed in large part to the same influence that occasions pulmonary

betterment: the removal of pain, increase in nourishment taken, improved sleep, and lessened cough.

Another important factor is the increased accessibility of the larynx to treatment. After the epiglottis is removed it is often easy to destroy by galvanocauterization lesions that were previously completely hidden. It is a fact that a surprising subsidence in these accompanying processes is frequently observed.

The chief indication for amputation, however, is and must remain, the relief of pain, without thought to the eventual cure of either laryngeal or pulmonary diseases.

The one great contraindication, in the author's experience, is that form of epiglottic involvement, either infiltrative or ulcerative, in which the process is beginning to involve the base of the tongue or the pharyngoepiglottic folds.

The entire lateral walls and base of the tongue may and usually do break down within a few weeks after the very first signs of disease become manifest. In these cases only is amputation absolutely contraindicated. In all others, if pain exists and is uncontrollable by other treatment, excision is advisable. No bad effect upon the general health has been observed. Complete anesthesia can be obtained, and the operation itself need not, in the average case, require more than a half minute.

Ozena and Asphyxiating Gas.

BY MARCEL NATIER, M. D.,

PARIS, FRANCE.

The writer finds a melancholy pleasure in presenting the lamentable history of a young soldier, in that he feels that the recital of his case goes to prove conclusively that ozena is but a local manifestation of a constitutional condition, a fact which Natier had repeatedly maintained in previous communications.

In October, 1915, a soldier, twenty-four years of age, who had always been in perfect health, no hereditary or venereal affection, received five bullet wounds and was rendered unconscious by a bomb of asphyxiating gas. His mask had dried up and was valueless. He recovered consciousness only

to fall into repeated syncope. He was carried to the rear, transferred to Vitry le Francois, where he had to remain three weeks because of his febrile condition. He suffered most excruciating pains from his nose to the bifurcation of his bronchi, and received special care. Five weeks after the accident he was removed to Paris, to a base hospital, where he remained six months. During all this time he could not swallow except with most excruciating pains. He then was admitted, March 18, 1916, to the Salpetriere, where his extreme muscular weakness, respiratory troubles, ozena and vomiting were noted. On October 25th the writer first saw him, and noted remarkable collapse of both alæ, ozena active, marked anemia. The collapse of the alæ caused insomnia and mouth breathing, with pain. To relieve this the patient put pieces of a match in each nostril on going to sleep. The ozena was noticed three or four months after the accident for the first time. Irrigations with warm salt water, while causing pain, was followed by amelioration.

As the patient was always well until his injuries, the writer feels justified in tracing the causal factor of his ozena to the asphyxiating gas and the subsequent functional disorders.

Ordinarily ozena is considered inseparable from old and far advanced atrophic rhinitis traceable back to the first years of life, the atrophy slowly developing.

In this soldier the determining cause was at the time sudden and violent, the effect cruel and deplorable. That the unfortunate man did not succumb immediately or in the general delay at the arrival of succor is marvelous. The poor fellow was fortunate in that he did not develop tuberculosis, as thousands of others do. The patient recovered.

The writer says, in his opinion ozena is not a true morbid entity, idiopathic or real, but a unique and always a symptomatic expression of a profound localized disturbance of the general health. Once again it is verified, and supports the assertion that ozena is but a consequence, distant more often, but also under color of exceptional events of the physiologic calamity. The cause of the latter is of less importance. Its intensity merits consideration.

This truth admitted and its verity visible, impresses him.

We are compelled to discard, as he has always done in his

studies of the subject, the various theories more or less fantastic, and in particular the microbic theory, invoked to explain the production of ozena.

(1) *Sarcoma of the Nasal Septum*; (2) *Laryngoepiglottidean Cyst*.

BY MAX A. GOLDSTEIN, M. D.,

ST. LOUIS.

Male, aged fifty-six years. Eighteen months ago began to be troubled with occasional obstruction of left side of nose, continuing about a month, followed by relief and then recurrence. No history of epistaxis. Latterly two or three nose-bleeds, not very profuse. No headache or pain of any kind. Loss of fifteen pounds in weight in six months.

Nasal Examination.—Mass on septum obstructing left side. Right surface of septum infiltrated and thickened, causing some obstruction on that side. Nasopharynx negative. Throat negative. No evidence of involvement of the accessory sinuses.

Operation.—September 26, 1916, mass, together with the entire septum, being extirpated. Recurrence after one month. Histologic examination of mass showed round cell sarcoma.

A Case of Laryngoepiglottidean Cyst.

Boy, twelve years old, came under observation September 27, 1915. Had been hoarse since he was one month old. This hoarseness had been ascribed by family physician to a "cold." No laryngologic examination had at any time been made. The condition seemed to remain quiescent all these years until shortly before the boy was brought to the writer for examination, at which time he had become very dyspneic. The dyspnea was quite marked; patient anemic and frail, not cyanotic, and unable to speak above a whisper. There had not been much difficulty in swallowing. No regurgitation of food. Laryngeal examination showed a mass the size of a walnut on the left side, involving the laryngoepiglottidean region. There was no fever. Mass was yielding to touch and could easily be palpated with the finger. Mass incised, the contents consisting of clear, yellow, sticky fluid.

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